Deanship of Graduate Studies

Al- Quds University

Quality of life and posttraumatic stress disorder among adult females with cancer attending Beit-Jala Governmental Hospital in Bethlehem

Beesan M.Nader Maraqa

M.Sc. Thesis

Jerusalem –Palestine

1437-2016

Quality of life and posttraumatic stress disorder among adult females with cancer attending Beit-Jala Governmental Hospital in Bethlehem

Prepared by:

Beesan M.Nader Maraqa

B.Sc: Medical Doctor-AlQuds University/Palestine

Supervisor: Dr. Muna Ahmead

A thesis submitted in partial fulfillment of requirements for the degree of Master of Public Health/School of Public Health-AlQuds University

1437-2016

AL-Quds University

Deanship of Graduate Studies

Epidemiology, Faculty of Public Health

Thesis Approval

Quality of life and posttraumatic stress disorder among adult females with cancer attending Beit-Jala Governmental Hospital in Bethlehem

Prepared by: Beesan M.Nader Maraqa

Registration No. : 21311774

Supervisor : Dr. Muna Ahmead

Master thesis submitted and accepted, Date:16/7/2016

The names and the signature of the examining committee members are as follows:

Head of Committee: Dr. Muna Ahmead Signature: Dr. Muna Ahmead

Internal examiner: Dr. Asma Imam Signature: .....

External examiner: Dr. Asaad Ramlawi Signature: .....

Jerusalem-Palestine

1437-2016

Dedication

To my mother and father, who support me throughout my journey, to my husband and children for their patience and understanding, to my friends who provide me with their support whenever I need.

I dedicate this to you all.

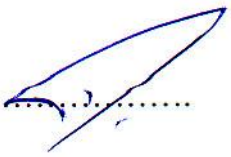
الاهداء

الى امي و ابي اللذان يدعمانني دائما في رحلتي التعليمية، و الى زوجي و ابنائي اللذين صبروا و تحملوا عناء غيابي عنهم اثناء دراستي ، و الى صديقاتي اللواتي دائما ما أجدهن بجانبي عند حاجتي لهن.

أهدي ثمرة هذا الجهد

Declaration

I cirtify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged. This thesis has not been submitted for the award of any other degree at any university or institution.

Signed: 

Beesan M. Nader Maraqa

Date: 16th July, 2016

Acknowledgement

I would like to express my grateful, sincere thanks to my supervisor Dr. Muna Ahmead for her help and support involved in all the steps of this research and also my deep thanks for her invaluable knowledge through the research process, without her support and cooperation, this work would not have been possible.

Further, I would like to thanks all the staff in faculty of Public Health in Al-Quds University for their academic and social support especially Dr. Nuha al-sharief.

My high appreciation to Dr. Asma Imam my internal examiner for her valuable insights and suggestions.

My sincere gratitude appreciation for Dr. Asaad Ramlawi my external examiner for his support and assistance.

Many thanks to the field worker Affaf Abu Mohhameid for here dedicated work in data collection, also special thanks to nurses and physicians in Beit-Jala Governmental hospital in Bethlehem for their cooperation.

My deep thanks to all females who participated in this study and who helped me in completing my thesis.

Finally, thanks are due to all who helped me in any way through my study for the master degree.

Abstract

Background: Cancer is a leading causes of morbidity and mortality worldwide. The quality of life of cancer survivors has been highlighted worldwide as a major health concern (Ferrell al., 1995). Also, post-traumatic stress disorder (PTSD) has been increasingly diagnosed as a co-morbidity among patients with cancer and PTSD symptoms are negatively related to QOL (Mehnert & Koch, 2008).

Aim of the study:

The aim was to assess QOL and PTSD symptoms among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem.

Design of the study

A cross-sectional design was utilized to achieve the purpose of the study. The data was gathered from the 4th of April ,2015 and finished at the end of July, 2015.

Sample size:

The sample included 253 female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem

Sampling method:

Convenience sampling was used to recruit the participants

Instruments

Data was collected by using self-reported questionnaire including socio-demographic data sheet, "European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQC30) and Post traumatic stress disorder checklist (PCL-S) for PTSD symptom.

Data analysis

Statistical analysis was performed using the statistical package for social sciences (SPSS), version 20 and data were analyzed by using parametric tests including descriptive statistics, T-test, ANOVAs test, Tukey test, Chi-square test and Pearson's test.

Findings

Analysis of the patients' characteristics showed that the mean age of the participants was 52.6 years old of which 56.1% were 50 years and older. The majority of the participants (77.9%) were married, 64.8% were from Hebron 58.5% lived in villages, 62.4% had education equal to or less than secondary education and 64% had income less than 2,000 NIS monthly.

For the participants' medical history, 85% had breast cancer, 69.2% had less than one year of cancer diagnosis and 73.9% were treated with surgery and chemotherapy.

The current study showed poor global quality of life (57.4%) and physical function (48.5%) for female patients with cancer. The indications for poor QOL were: old age, low educational level , low economic class, being unmarried, low number of family members and dependence on others for care. However, the means of other QOL functions were high particularly social function (87.7%), role function (64.3%), emotional function (77.8%), and cognitive function (77%), which was lower than the references values.

Moreover, the participants complained from physical symptoms that may affect their quality of life as 34.7% of the participants reported severe insomnia, 32.8% had severe loss of appetite, 24.1% had severe constipation and 20.5% had severe fatigue while 11.4% reported severe pain.

The prevalence of PTSD symptoms was 3%. For PTSD symptoms severity, (2%) reported severe symptoms, (23.3%) reported moderate symptoms and (68.8%) reported mild symptoms based on Weathers et al. (1991) classification of PTSD

symptoms severity scores. Also PTSD symptoms were associated with young age and having other types of cancer rather than breast cancer.

Furthermore, the Pearson's test revealed a strong inversed statistically significant relationship between quality of life domains and PTSD. The strongest relationship was with emotional function.

Conclusion

The study found that the overall quality of life of female patients with cancer was low and is strongly associated with PTSD symptoms, so early detection and treatment for these symptoms are important to improve their quality of life.

نوعية الحياة وأعراض ما بعد الصدمة لدى مريضات السرطان في مستشفى بيت جالا الحكومي في بيت لحم

إعداد: بيسان محمد نادر مرقه.

إشراف: د. منى حميد.

الملخص

خلفية الدراسة

السرطان هو السبب المباشر للعديد من المشكلات الصحية والوفيات في جميع انحاء العالم . و قد تم تسليط الضوء في الآونة الاخيرة على نوعية الحياة لمرض السرطان في جميع أنحاء العالم (Ferrell al., 1995). اضافة الى انه قد تم تشخيص اضطراب ما بعد الصدمة (PTSD) على نحو متزايد بين المرضى الذين يعانون من السرطان وقد وجد ان أعراض اضطراب ما بعد الصدمة يؤثر سلبا على نوعية الحياة لمرضى السرطان (Mehnert & Koch,2008).

الهدف العام

تقييم نوعية الحياة وأعراض اضطراب ما بعد الصدمة بين المريضات البالغات المصابات بالسرطان اللواتي يتلقين العلاج في مستشفى بيت جالا الحكومي في بيت لحم.

منهجية الدراسة

استخدمت الدراسة المنهجية الكميه المقطعية حيث تم تجميع البيانات خلال 4 شهور من 4 نيسان إلى 31 تموز عام 2015.

عينه الدراسة

ضمت عينه الدراسة 253 مريضة مصابة بالسرطان في مستشفى بيت جالا الحكومي في بيت لحم بواسطة استعمال استبيان ذاتي التعبئة يتكون من جزء لفحص البيانات الاجتماعية والديموغرافية و جزء يقيم نوعية الحياة لمريضات السرطان باستعمال اداة فحص نوعية الحياة لمرضى السرطان للمنظمة الأوروبية للأبحاث وعلاج مرض السرطان (EORTC QLQC30) وجزء لتقييم اعراض ما بعد الصدمة بعد تشخيص مرض السرطان باستخدام الاداة المنهجية لقياس أعراض اضطراب ما بعد الصدمة (PCL -S). تم إجراء التحليل الإحصائي باستخدام الحزم الإحصائية للعلوم الاجتماعية (SPSS)، الإصدار 20 و تم تحليل البيانات باستخدام اختبار التكرار واختبار تحليل التباين الأحادي واختبار تيتيست واختبار توكي واختبار كاي تربيع واختبار بيرسون.

النتائج

أظهرت نتائج تحليل بيانات المرضى أن متوسط عمر المشاركات كان 52.6 سنة. في حين كانت عمر 56.1% من المشاركات 50 سنة وما فوق. غالبية المشاركات كن متزوجات (77.9%) و 64.8 % كن من الخليل و 58.5 % يعيشن في القرى. في حين تعليم 62.4 % منهن أقل من التعليم الثانوي، وكان الدخل الشهري ل 64% منهن أقل من 2000 شيكل شهريا .

من ناحية التاريخ الطبي للمشاركات، 85% من المشاركات كن مصابات بسرطان الثدي. و قد تم تشخيص 69.2% من المشاركات في أقل من سنة في حين كان علاج 73.9% منهم يشمل العلاج الجراحي والعلاج الكيميائي .

أظهرت الدراسة الحالية تدني جودة الحياة (57.4 %) و الوظائف الجسدية (48.5 %) لمريضات السرطان في مستشفى بيت جالا الحكومي. حيث كانت المحددات الكمية التي أثرت بشكل سلبي على نوعية الحياة: العمر وانخفاض المستوى التعليمي و الاقتصادي و العزوبية .

و لكن كانت نتائج مقاييس الوظائف الاخرى لمقياس جودة الحياة جيدة: الاجتماعية (87.7 %) و الدور (64.3%) و العاطفة (77.8%) و الادراك (77%) . في حين أفادت 34.7 % من المشاركات انهن يعانين من الأرق الشديد و 32.8% عانين من فقدان الشهية و 24.1 %عانين من إمساك شديد و 20.5 % عانين من التعب الشديد بينما 11.4% فقط عانين من ألم شديد .

كان انتشار أعراض اضطراب ما بعد الصدمة 3% بين المشاركات. و بالنسبة لشدة أعراض اضطراب ما بعد الصدمة فان 2% كانت الأعراض لديهن شديدة و 23.3 % كانت الاعراض لديهن معتدلة و 68.8% كانت لديهن أعراض خفيفة باستخدام تصنيف (Weathers et al., 1991) لتصنيف شدة أعراض ما بعد الصدمة. بينما كانت المحددات الكمية التي ارتبطت بأعراض اضطراب ما بعد الصدمة هي صغر السن و وجود أنواع السرطان الاخرى غير سرطان الثدي لدى المشاركة.

علاوة على ذلك فقد كشف اختبار بيرسون علاقة عكسية ذات دلالة إحصائية قوية بين جودة الحياة و اضطرابات ما بعد الصدمة. وكانت أقوى علاقة بين اضطراب ما بعد الصدمة مع الجانب العاطفي في مقياس جودة الحياة.

الخلاصة

وجدت الدراسة أن نوعية حياة المرضى من النساء المصابات بالسرطان يرتبط بقوة مع أعراض اضطراب ما بعد الصدمة ، لذا الاكتشاف المبكر وعلاج هذه الأعراض هي مهمة لتحسين نوعية و جودة حياتهم .

Table Of Contents

List of tables

List of Figures

List of appendixes

Abbreviations

WHO	World Health Organization
QOL	Quality of Life
PTSD	Post-traumatic stress disorder
DSM-IV	Diagnostic and Statistical Manual of Mental
PMOH	Palestinian Ministry of Health
HRQOL	Health-Related Quality of Life
CAPS	Clinician-Administered diagnostic assessment of Posttraumatic Stress disorders
ASD	Acute stress disorder
PCL	PTSD Checklist
PCL-C	PTSD Checklist-Civilian
PCL-S	PTSD Checklist-Specific
IES	Impact Event Scale
GQOL	Global quality of life
PF	Physical functioning
RF	Role functioning
EF	Emotional functioning
CF	Cognitive functioning
SF	Social functioning
FA	Fatigue
NV	Nausea and Vomiting
PA	Pain
FI	Financial Difficulties

AL-Quds University

Deanship of Graduate Studies

Epidemiology, Faculty of Public Health

Thesis Approval

Quality of life and posttraumatic stress disorder among adult females with cancer attending Beit-Jala Governmental Hospital in Bethlehem

Prepared by: Beesan M.Nader Maraqa

Registration No. : 21311774

Supervisor : Dr. Muna Ahmead

Master thesis submitted and accepted, Date:16/7/2016

The names and the signature of the examining committee members are as follows:

Head of Committee: Dr. Muna Ahmead Signature: Dr. Muna Ahmead

Internal examiner: Dr. Asma Imam Signature: .....

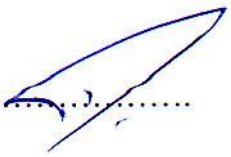
External examiner: Dr. Asaad Ramlawi Signature: .....

Jerusalem-Palestine

1437-2016

Declaration

I cirtify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged. This thesis has not been submitted for the award of any other degree at any university or institution.

Signed: 

Beesan M. Nader Maraqa

Date: 16th July, 2016

Acknowledgement

I would like to express my grateful, sincere thanks to my supervisor Dr. Muna Ahmead for her help and support involved in all the steps of this research and also my deep thanks for her invaluable knowledge through the research process, without her support and cooperation, this work would not have been possible.

Further, I would like to thanks all the staff in faculty of Public Health in Al-Quds University for their academic and social support especially Dr. Nuha al-sharief.

My high appreciation to Dr. Asma Imam my internal examiner for her valuable insights and suggestions.

My sincere gratitude appreciation for Dr. Asaad Ramlawi my external examiner for his support and assistance.

Many thanks to the field worker Affaf Abu Mohhameid for here dedicated work in data collection, also special thanks to nurses and physicians in Beit-Jala Governmental hospital in Bethlehem for their cooperation.

My deep thanks to all females who participated in this study and who helped me in completing my thesis.

Finally, thanks are due to all who helped me in any way through my study for the master degree.

Abstract

Background: Cancer is a leading causes of morbidity and mortality worldwide. The quality of life of cancer survivors has been highlighted worldwide as a major health concern (Ferrell al., 1995). Also, post-traumatic stress disorder (PTSD) has been increasingly diagnosed as a co-morbidity among patients with cancer and PTSD symptoms are negatively related to QOL (Mehnert & Koch, 2008).

Aim of the study:

The aim was to assess QOL and PTSD symptoms among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem.

Design of the study

A cross-sectional design was utilized to achieve the purpose of the study. The data was gathered from the 4th of April ,2015 and finished at the end of July, 2015.

Sample size:

The sample included 253 female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem

Sampling method:

Convenience sampling was used to recruit the participants

Instruments

Data was collected by using self-reported questionnaire including socio-demographic data sheet, "European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQC30) and Post traumatic stress disorder checklist (PCL-S) for PTSD symptom.

Data analysis

Statistical analysis was performed using the statistical package for social sciences (SPSS), version 20 and data were analyzed by using parametric tests including descriptive statistics, T-test, ANOVAs test, Tukey test, Chi-square test and Pearson's test.

Findings

Analysis of the patients' characteristics showed that the mean age of the participants was 52.6 years old of which 56.1% were 50 years and older. The majority of the participants (77.9%) were married, 64.8% were from Hebron 58.5% lived in villages, 62.4% had education equal to or less than secondary education and 64% had income less than 2,000 NIS monthly.

For the participants' medical history, 85% had breast cancer, 69.2% had less than one year of cancer diagnosis and 73.9% were treated with surgery and chemotherapy.

The current study showed poor global quality of life (57.4%) and physical function (48.5%) for female patients with cancer. The indications for poor QOL were: old age, low educational level , low economic class, being unmarried, low number of family members and dependence on others for care. However, the means of other QOL functions were high particularly social function (87.7%), role function (64.3%), emotional function (77.8%), and cognitive function (77%), which was lower than the references values.

Moreover, the participants complained from physical symptoms that may affect their quality of life as 34.7% of the participants reported severe insomnia, 32.8% had severe loss of appetite, 24.1% had severe constipation and 20.5% had severe fatigue while 11.4% reported severe pain.

The prevalence of PTSD symptoms was 3%. For PTSD symptoms severity, (2%) reported severe symptoms, (23.3%) reported moderate symptoms and (68.8%) reported mild symptoms based on Weathers et al. (1991) classification of PTSD

symptoms severity scores. Also PTSD symptoms were associated with young age and having other types of cancer rather than breast cancer.

Furthermore, the Pearson's test revealed a strong inversed statistically significant relationship between quality of life domains and PTSD. The strongest relationship was with emotional function.

Conclusion

The study found that the overall quality of life of female patients with cancer was low and is strongly associated with PTSD symptoms, so early detection and treatment for these symptoms are important to improve their quality of life.

نوعية الحياة وأعراض ما بعد الصدمة لدى مريضات السرطان في مستشفى بيت جالا الحكومي في بيت لحم

إعداد: بيسان محمد نادر مرقه.

إشراف: د. منى حميد.

الملخص

خلفية الدراسة

السرطان هو السبب المباشر للعديد من المشكلات الصحية والوفيات في جميع انحاء العالم . و قد تم تسليط الضوء في الآونة الاخيرة على نوعية الحياة لمرض السرطان في جميع أنحاء العالم (Ferrell al., 1995). اضافة الى انه قد تم تشخيص اضطراب ما بعد الصدمة (PTSD) على نحو متزايد بين المرضى الذين يعانون من السرطان وقد وجد ان أعراض اضطراب ما بعد الصدمة يؤثر سلبا على نوعية الحياة لمرضى السرطان (Mehnert & Koch,2008).

الهدف العام

تقييم نوعية الحياة وأعراض اضطراب ما بعد الصدمة بين المريضات البالغات المصابات بالسرطان اللواتي يتلقين العلاج في مستشفى بيت جالا الحكومي في بيت لحم.

منهجية الدراسة

استخدمت الدراسة المنهجية الكميه المقطعية حيث تم تجميع البيانات خلال 4 شهور من 4 نيسان إلى 31 تموز عام 2015.

عينه الدراسة

ضمت عينه الدراسة 253 مريضة مصابة بالسرطان في مستشفى بيت جالا الحكومي في بيت لحم بواسطة استعمال استبيان ذاتي التعبئة يتكون من جزء لفحص البيانات الاجتماعية والديموغرافية و جزء يقيم نوعية الحياة لمريضات السرطان باستعمال اداة فحص نوعية الحياة لمرضى السرطان للمنظمة الأوروبية للأبحاث وعلاج مرض السرطان (EORTC QLQC30) وجزء لتقييم اعراض ما بعد الصدمة بعد تشخيص مرض السرطان باستخدام الاداة المنهجية لقياس أعراض اضطراب ما بعد الصدمة (PCL -S). تم إجراء التحليل الإحصائي باستخدام الحزم الإحصائية للعلوم الاجتماعية (SPSS)، الإصدار 20 و تم تحليل البيانات باستخدام اختبار التكرار واختبار تحليل التباين الأحادي واختبار تيتيست واختبار توكي واختبار كاي تربيع واختبار بيرسون.

النتائج

أظهرت نتائج تحليل بيانات المرضى أن متوسط عمر المشاركات كان 52.6 سنة. في حين كانت عمر 56.1% من المشاركات 50 سنة وما فوق. غالبية المشاركات كن متزوجات (77.9%) و 64.8 % كن من الخليل و 58.5 % يعيشن في القرى. في حين تعليم 62.4 % منهن أقل من التعليم الثانوي، وكان الدخل الشهري ل 64% منهن أقل من 2000 شيكل شهريا .

من ناحية التاريخ الطبي للمشاركات، 85% من المشاركات كن مصابات بسرطان الثدي. و قد تم تشخيص 69.2% من المشاركات في أقل من سنة في حين كان علاج 73.9% منهم يشمل العلاج الجراحي والعلاج الكيميائي .

أظهرت الدراسة الحالية تدني جودة الحياة (57.4 %) و الوظائف الجسدية (48.5 %) لمريضات السرطان في مستشفى بيت جالا الحكومي. حيث كانت المحددات الكمية التي أثرت بشكل سلبي على نوعية الحياة: العمر وانخفاض المستوى التعليمي و الاقتصادي و العزوبية .

و لكن كانت نتائج مقاييس الوظائف الاخرى لمقياس جودة الحياة جيدة: الاجتماعية (87.7 %) و الدور (64.3%) و العاطفة (77.8%) و الادراك (77%) . في حين أفادت 34.7 % من المشاركات انهن يعانين من الأرق الشديد و 32.8% عانين من فقدان الشهية و 24.1 %عانين من إمساك شديد و 20.5 % عانين من التعب الشديد بينما 11.4% فقط عانين من ألم شديد .

كان انتشار أعراض اضطراب ما بعد الصدمة 3% بين المشاركات. و بالنسبة لشدة أعراض اضطراب ما بعد الصدمة فان 2% كانت الأعراض لديهن شديدة و 23.3 % كانت الاعراض لديهن معتدلة و 68.8% كانت لديهن أعراض خفيفة باستخدام تصنيف (Weathers et al., 1991) لتصنيف شدة أعراض ما بعد الصدمة. بينما كانت المحددات الكمية التي ارتبطت بأعراض اضطراب ما بعد الصدمة هي صغر السن و وجود أنواع السرطان الاخرى غير سرطان الثدي لدى المشاركة.

علاوة على ذلك فقد كشف اختبار بيرسون علاقة عكسية ذات دلالة إحصائية قوية بين جودة الحياة و اضطرابات ما بعد الصدمة. وكانت أقوى علاقة بين اضطراب ما بعد الصدمة مع الجانب العاطفي في مقياس جودة الحياة.

الخلاصة

وجدت الدراسة أن نوعية حياة المرضى من النساء المصابات بالسرطان يرتبط بقوة مع أعراض اضطراب ما بعد الصدمة ، لذا الاكتشاف المبكر وعلاج هذه الأعراض هي مهمة لتحسين نوعية و جودة حياتهم .

Table Of Contents

List of tables

List of Figures

List of appendixes

Abbreviations

WHO	World Health Organization
QOL	Quality of Life
PTSD	Post-traumatic stress disorder
DSM-IV	Diagnostic and Statistical Manual of Mental
PMOH	Palestinian Ministry of Health
HRQOL	Health-Related Quality of Life
CAPS	Clinician-Administered diagnostic assessment of Posttraumatic Stress disorders
ASD	Acute stress disorder
PCL	PTSD Checklist
PCL-C	PTSD Checklist-Civilian
PCL-S	PTSD Checklist-Specific
IES	Impact Event Scale
GQOL	Global quality of life
PF	Physical functioning
RF	Role functioning
EF	Emotional functioning
CF	Cognitive functioning
SF	Social functioning
FA	Fatigue
NV	Nausea and Vomiting
PA	Pain
FI	Financial Difficulties

Chapter One

Introduction

1.1. Introduction

Cancer is a leading cause of morbidity and mortality worldwide, with approximately 14 million new cases and 8.2 million cancer related deaths in 2012 in both sexes. The number of new cases is expected to rise by about 70% over the next decades (WHO, 2014a). About half of cancer cases and deaths occurred worldwide were among women. The top three were breast, colorectal and lung cancers, contributed more than 43% of all women cancers (excluding non-melanoma skin cancer). Breast cancer was the most frequently diagnosed worldwide in women contributing to more than 25% of the total number of new cases diagnosed in 2012 (Stewart & Wild, 2014).

Many of the greatest reductions in the morbidity and mortality of cancer recently are a result of advances in cancer prevention. Importantly, healthy approaches to living can also reduce cancer recurrence and improve outcomes following a cancer diagnosis (Hartge et al., 2006).

"Cancer survivorship" is a term that has come to represent the state or process of living following a diagnosis of cancer, regardless of how long a person lives. It is a concept used by many health care professionals, researchers, and patients with cancer to understand not only the physical but also the social, psychological, and spiritual/existential impact of cancer on one's life and for the remainder of one's life. When viewed as a continual, dynamic, and ever-changing process that begins at the moment of diagnosis and continues for the remainder of life, cancer survivorship can be defined as the experience of "living with, through, or beyond cancer" (Detre et al., 1992).

The term quality of life (QOL) is used to evaluate the general well-being of individuals and societies. According to the World Health Organization (WHO), QOL is defined as "individual's perception of life, values, objectives, standards and interests in the framework of culture" (WHO, 1997b).

As the definition of QOL points, a number of illness-related factors can affect QOL and QOL issues has become a vital area of concern to cancer survivors, their families and care providers (Ferrell et al., 1995). Each patient with cancer experiences a range of practical, psychological and emotional challenges as a result of their diagnosis and treatment-related adverse effects, and each patient's life may be further disrupted by changes in role and family functioning, employment status and financial status. In addition, some patients will have to come to terms with progressive illness and may approach death, and others may be faced with the physical, emotional and social challenges of survival (Adler, 2008). Therefore, the amount of distress symptoms experienced by an individual has been related to QOL in people with cancer and is increasingly being used as a primary outcome measure in studies to evaluate the effectiveness of treatment among them (Guyatt et al., 1993).

Also, when considering the psychological health of cancer survivors, anxiety disorders are the major mental disorders that were studied. The prevalence of anxiety disorders has been estimated to range from 6% to 23% among patients with cancer (Lynch et al., 2000). The wide range represented by these estimates reflects the difficulties involved in identifying the prevalence of specific psychological responses associated with the cancer experience (Adler, 2008).

Anxiety and distress may affect a patient's ability to cope with cancer diagnosis or treatment and may cause patients to miss check-ups or delay treatment (NCI, 2015c). Post-traumatic stress disorder (PTSD) is one of anxiety disorders with characteristic symptoms that occur following exposure to an extreme traumatic stress involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate. These symptoms include persistent re-experiencing of the traumatic event, persistent avoidance of stimuli associated with the trauma and numbing of general

responsiveness, and persistent symptoms of increased arousal (American Psychiatric Association, 2000, 2013) . In 1994, the trauma criteria of post-traumatic stress disorder (PTSD) in Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) were expanded to include life-threatening illness, such as cancer (Mehnert & Koch, 2008).

1.2. Problem statement

Cancer survivors were more likely to have "worse" or impaired QoL compared with the general population, regardless of other demographic factors (Quinn et al., 2015). For example, a study assessed the quality of life for patients with breast cancer, and the results showed that patients had low global quality of life (mean=32) at 18 months post cancer diagnosis (Montazeri et al., 2008).

In Palestine, a recent QOL study aimed to assess the determinants of quality of life (QOL) in patients with cancer showed a poor-health-related QOL. It also showed a low mean score for global quality of life (41.8) and other functional domains such as physical, role and emotional scales which were below half of full functioning (48.5,48.8,46 respectively). It recommended to integrate special services, such as palliative care, into the health-care system for patients with cancer to improve QOL and to reduce their suffering (Khleif & Imam, 2013).

As cancer is an experience of repeated trauma, patients with cancer may experience stress symptoms at any stage from diagnosis to completion of treatment or cancer recurrence (NCI, 2015). Post-traumatic stress disorder (PTSD) has been increasingly diagnosed as a co-morbidity among patients with cancer (Mulligan et al., 2014). For example, Cordova et al. (1995) were the first who assessed quality of life (QOL) and PTSD-like symptoms in 55 women post treatment for breast cancer. PTSD symptoms were negatively related to QOL, and PTSD prevalence was ranging from 5% to 10%.

Also, a large study was conducted in Germany to measure psychosocial co-morbidity (such as PTSD) and quality of life (QOL) and their association with each other and to assess the need for psychosocial support in long-term breast cancer survivors. Posttraumatic stress disorder was observed in 12% of the participants. Meanwhile, disease progress, less social support, a lower educational level, and younger age were the predictors of psychological co-morbidity with a significant impact of psychological co-morbidity on QOL of these patients with breast cancer (Mehnert & Koch, 2008).

Psychological problems are often neglected in patients with cancer, and consequently they remain untreated. There is a relationship between health-related quality of life (HRQOL) and PTSD, and there is lack of studies to assess this relation in Palestine. So, this study will assess PTSD as a psychological squeal following cancer diagnosis and its relation to QOL.

1.3. Significance of the study:

Quality of life of cancer survivors has been highlighted worldwide as a major health concern. The concept of health-related quality of life (HRQOL) and its determinants have evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health—either physical or mental (McHorney, 1999). On the individual level, this includes physical and mental health perceptions and their correlates, including health risks and conditions, functional status, social support, and socioeconomic status (CDC, 2012).

The literature reveals a lack of studies in Palestine that assess the quality of life in relation to psychological symptoms such as PTSD symptoms among female patients with cancer. Indeed, to our knowledge this may be the first study conducted for this purpose. The results of the current study may help Palestinian Ministry of Health in establishing evidence-based psychological support program for those patients and to improve their quality of life and treat PTSD symptoms.

1.4. Purpose of the study :

The purpose of the study was to assess the QOL and PTSD symptoms prevalence among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem.

1.5. Specific objectives :

- To assess the relationship between QOL and independent variables such as age, economic class, education, marital status, cancer type, treatment and length of

diagnosis and psychological history among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem.

- To assess the relationship between PTSD and independent variables such as age , economic class, education, marital status, cancer type, treatment and length of diagnosis and psychological history among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem.
- To assess the relationship between PTSD and QOL among adult females patients with cancer aged 18 and above attending Beit-Jala Governmental Hospital in Bethlehem.
- To assess the relationship between GQOL and symptoms scale in the QOL questionnaire.

1.6. Research questions :

- What is the quality of life of adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem?
- What is the prevalence of PTSD symptoms among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem?
- Is there a relationship between QOL and PTSD symptoms among adult female patients with cancer attending in Beit-Jala Governmental Hospital in Bethlehem?
- Is there a relationship between independent variables such as socio-demographic data (age, economic class, education and marital status), cancer type, and treatment, length of diagnosis and psychological history and QOL among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem?
- Is there a relationship between independent variables such as socio-demographic data (age, economic class, education, marital status), cancer type, treatment, length of diagnosis and psychological history and PTSD among adult female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem?

1.7. Feasibility of the study

- Ethical approval was obtained from Al-Quds University.
- The researcher herself is working at the Palestinian Ministry of Health and she has a close contact with females underwent breast cancer screening. Also, she works as a doctor in Mammography Screening Unit in Bethlehem district and has a contact with surgical and oncology department in Beit-Jala Governmental Hospital in Bethlehem which facilitated the collection of data.
- An approval from the Palestinian Ministry of Health was obtained before conducting the study in Beit-Jala Governmental Hospital.

1.8. Summary:

Cancer is one of the most prevalent non-communicable diseases worldwide. Future advances in cancer treatment prolong cancer survival and highlighted the importance of quality of life issues among cancer survivors. Meanwhile, literature showed that psychological morbidities including post-traumatic stress disorder (PTSD) have significant impact on quality of life of patients with cancer. However, there is a lack of studies that assessed the prevalence of PTSD symptoms and QOL among female patients with cancer in the Arab world including Palestine. So the current study aimed to assess the QOL and PTSD symptoms prevalence among adult female patients with cancer registered in Beit-Jala Governmental Hospital in Bethlehem.

This chapter presented the problem statement, the study objectives, research questions and feasibility of the current study.

The next chapter discussed the literature review of the current study.

Chapter Two

Literature Review

2.1 Cancer

2.1.1. Introduction to Cancer

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through blood and lymph systems. Cancer is caused by both external factors (tobacco, chemicals, radiation, and infectious organisms) and internal factors (inherited mutations, hormones, immune conditions, and mutations that occur from metabolism). These causal factors may act together or in sequence to initiate or promote carcinogenesis (Nee, 2013).

Basic epidemiologic, and clinical research lead to improve cancer prevention, screening, and treatment decreasing cancer death rates and increases numbers of cancer survivors (NCI, 2015). Prolonged survival is attributable, in part, to improvements in early detection and combined modality treatments (De Moor et al., 2013). And because many modern cancer treatments result in side effects that must be managed after treatment completion, growing evidence indicates that care should extend into long-term survivorship with expanding attention to the psychosocial and physical consequences of surviving illness, psychological science and evidence-based practice are making important contributions to addressing the pressing needs of cancer survivors (Stanton et al., 2015). For example, cancer-,when diagnosed, is often associated with anxiety from diagnosis to treatment and survivorship, and it was found that anxiety disorders are elevated in samples of patients with cancer undergoing diagnosis and treatment compared with normative populations (Jacobsen & Andrykowski, 2015).

2.1.2. Cancer prevalence among women

Cancer is among the leading causes of morbidity and mortality worldwide particularly among women. Approximately, among 14 million new cases and 8.2 million cancer related deaths in 2012, half of these cases occurred in females. The number of new cases is expected to rise by about 70% over the next two decades (WHO, 2012).

Lung cancer was the most common cancer worldwide contributing 13% of the total number of new cases diagnosed in 2012, and breast cancer (women only) was the second most common cancer with nearly 1.7 million new cases in 2012, colorectal cancer was the third most common cancer with nearly 1.4 million new cases in 2012 (WHO, 2012).

Among men, the top three were lung, prostate and colorectal cancers, contributed nearly 42% of all cancers, other common cancers contributing more than 5% were stomach and liver (excluding non-melanoma skin cancer)(WHO, 2012).

Whereas among women, the top three were breast, colorectal and lung cancers, contributed more than 43% (excluding non-melanoma skin cancer). Breast cancer was the most common cancer worldwide in women contributing more than 25% of the total number of new cases diagnosed in 2012 while cervical cancer contributed nearly 8% of all cancers (excluding non-melanoma skin cancer) (WHO, 2012).

In 1990, it was estimated that 59% of female cancer cases occurred in more developed countries although these areas accounted for less than a quarter of the global female population at the time (Parkin, 1998). The situation changed considerably over the next two decades; by 2008, the total number of new diagnoses was evenly divided between more developed and less developed countries (Jemal et al., 2011; Youlden et al., 2012). By 2012, it was estimated that the majority (53%) of cases of female cancer were occurring in less developed countries (Ferlay et al., 2013).

Cancer is rising in developing countries, accounting for 55 percent of new cases world-wide, a figure that could reach 60 percent of reported new cases world-wide by 2020 (Frenk, 2009). It was found that approximately a quarter (24%) of all female breast cancers world-wide were diagnosed within the Asia-Pacific region (Youlden et al., 2014).

Regarding cancer fatality among women, breast cancer has a relatively low fatality rate. Although it has the highest mortality rate among women with cancer (mortality rate of 12.9

per 100,000 women with cancer), this is less than one third of the incidence rate. However, lung cancer mortality rate is the next highest cause of cancer mortality among women with a mortality rate of 11.1 per 100, 000 women with cancer (Stewart & Wild, 2014). Lung cancer fatality is considered higher than other types of cancer when compared to lung cancer incidence among women (WHO, 2014b).

In Palestine, cancer is the second most common cause of death, accounted for 14.2% of deaths in 2014. There were (2,294) new cancer cases reported in West Bank with an incidence rate of 82.2 per 100,000 of population according to the Palestinian Ministry of Health (PMoH, 2014).

Reported data for incidental cancer cases in Palestine showed approximately 1:1 male to female ratio. For example, the Palestinian Ministry of Health reported 2294 cancer cases in 2014 , where 50.7% (n=1162) were among males and 49.3% (n=1132) were among females (PMOH, 2014) and data in 2013 showed that the number of reported cancer cases was 2189 of which 48.4% (n=1062) were among males and 51.5% (n=1127) were among females (PMoH, 2013).

Cancer cases are distributed in eleven governorates in West Bank as seen in table (2.1). The highest number of reported female cancer cases was in Nablus where were 247 cancer cases representing 21.8% of all reported cancer cases in females with incident rate of 120.5 per 100,000 woman. Hebron was the second governorate in the number of reported cancer cases of females in 2014 as 221 cases were reported, although the incident rate was 67.1 per 100,000 woman. In Whereas the lowest reported number of cases was in Jericho with 13 reported new cases females with cancer and the incidence rate was 67 per 100,00 woman (PMoH, 2014). In 2013, the highest reported number of cancer cases among females was in Hebron as 225 cases were reported representing 22.6% of all reported cancer cases in females with incident rate of 74 per 100,000 woman, followed by Nablus which reported 205 cases of cancer among females representing 18.2% of all cancer cases in females with incident rate of 103.9 per 100,000 woman. The lowest reported number of cases was in Jericho with 17 reported new cases in females with cancer and incidence rate of 74.9 per 100,00 woman (PMoH, 2013).

Table (2.1) The distribution of reported cancer cases by gender & Governorate in Palestine, 2014.

Gender / Governorate	Male		Female		Total		Incidence Rate per 100,000
	No.	%	No.	%	No.	%	
Jenin	179	15.4	160	14.1	339	14.8	111.7
Tubas	28	2.4	24	2.1	52	2.3	83
Tulkarm	89	7.7	75	6.5	162	7.1	90.6
Nablus	202	17.4	247	21.8	449	19.6	120.5
Qalqiliya	47	4.0	50	4.4	97	4.2	89.9
Salfit	30	2.6	32	2.8	62	2.7	89.6
Ramallah	139	12.0	151	13.3	290	12.6	85.7
Jericho	21	1.8	13	1.1	34	1.5	67
Jerusalem	56	4.8	60	5.3	116	5.1	74.4
Bethlehem	133	11.4	101	8.9	234	10.2	111.2
Hebron	238	20.5	221	19.5	459	20.0	67.1
Total	1162	50.7	1132	49.3	2294	100	82.2

(PMoH, 2014)

For cancer type, the most commonly diagnosed cancer in the West Bank in 2014 was breast cancer with 387 reported cases, accounting for 16.9% of all reported cancer cases followed by colon cancer with 226 reported cases (9.9%) and lung cancer with 224 reported cases (9.8%) as seen in figure (2.1). In addition, lung cancer ranked the first among males while breast cancer was the most common among females (PMoH, 2014).

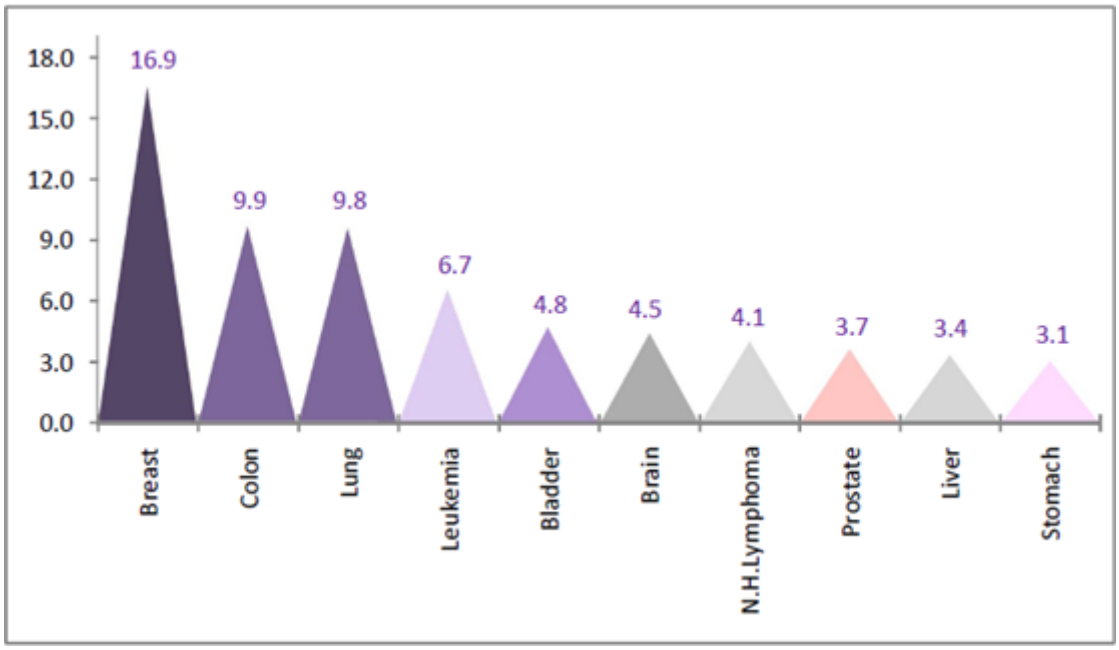


Figure (2.1) The most common reported cancer cases, West Bank (PMoH, 2014).

For females, breast cancer contributed to 33.9% of all cancers with 384 new cancer diagnosed cases, followed by colon cancer with the percentage of 9.1% of all cancer cases and 103 reported new cases and all types of leukemia contributed to 5.7% of all cancer cases among females with 65 newly reported cases as shown in figure (2.2) (PMoH, 2014). This increase might be as a result of increasing the number of cancer because of early detection.

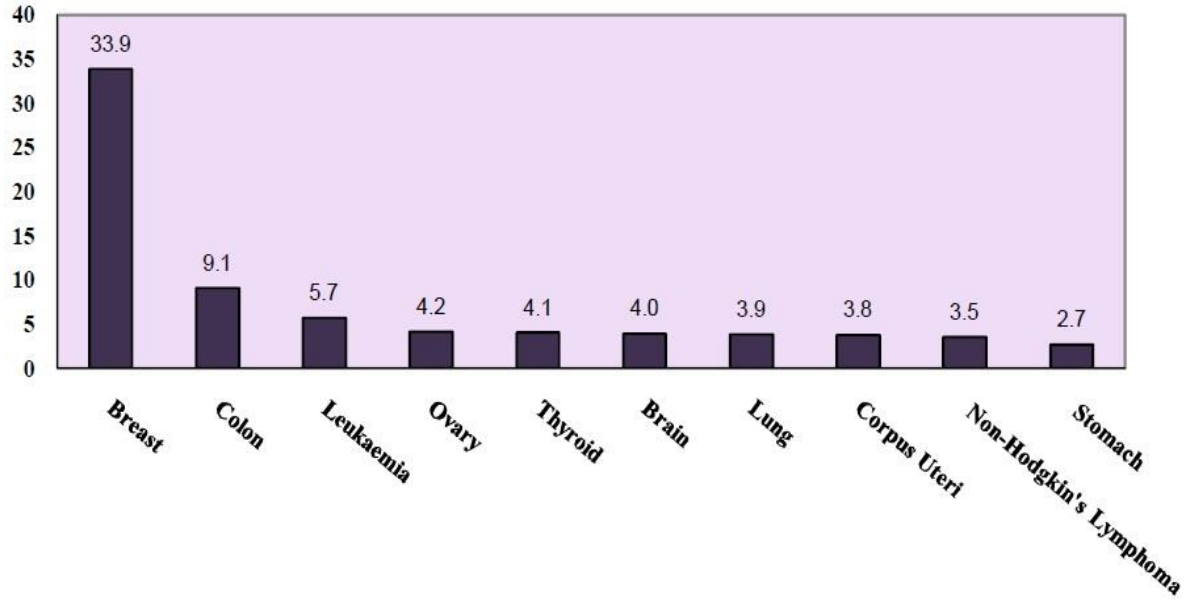


Figure (2.2) the percentage of top ten reported cancer types among females, West Bank (PMOH, 2014).

In summary, cancer is considered common among Palestinian women particularly breast cancer and is the second cause of death among them.

2.1.3. Most common types of cancer among women

Different cancer types have different epidemiology, etiology, pathology, genetics and prognosis (Bannasc, 2012). Women with breast cancer and men with prostate cancer comprise the two largest survivor groups, owing to the relatively high incidence and favorable prognosis of those cancers (Stanton et al., 2015). The most common cancer types among females are:

2.1.3.1 Breast cancer

Cancer that forms in tissues of the breast either in the ducts (Ductal carcinoma), or the milk glands (Lobular carcinoma) (Blackbourne et al., 2000). Breast cancer is the second most common cancer in the world and, by far, the most frequent cancer among women with an estimated 1.67 million new cancer cases diagnosed worldwide in 2012 (25% of all cancers) (Stewart & Wild, 2014).

2.1.3.2 Lung cancer

Lung cancer is a devastating malignant disease, it is the uncontrolled growth of cells in the lungs (Blackbourne et al., 2006). Although the rates of increase of new cases of lung cancer has leveled off, lung cancer remained the leading cause of cancer related death in the world (Andreoli et al., 2009).

In 2012, an estimated1.8 million new cases occurred worldwide (12.9% of the total), 58% of which occurred in the less developed regions (WHO, 2012). Tobacco smoking, including second-hand smoke, is the predominant risk factor of lung cancer worldwide. Other risk factors of lung cancer include radon, occupational exposure to polycyclic aromatic hydrocarbons, certain metals, asbestos, and crystalline silica, as well as exposure circumstances relevant to certain categories of work, and exposure to outdoor air pollution, and specifically to particulate matter and diesel engine exhaust, and to indoor air pollution, including second-hand tobacco smoke and emissions from household combustion of coal (Stewart & Wild, 2014).

2.1.3.3 Colo-rectal cancer

Colon cancer is cancer of the large intestine (colon) including the rectum (terminal part of colon) (Blackbourne et al., 2006). Colorectal cancer is the third most common cancer in men (746,000 cases, 10.0% of the total) and the second in women (614,000 cases, 9.2% of the total). Almost 55% of the cases occur in more developed regions (WHO, 2012).

2.1.3.4 Stomach cancer

It is the type of cancer that arises from any part of the stomach (Blackbourne et al., 2006). Stomach cancer is the fifth most common cancer worldwide, with an estimated 952 000 new cases (7% of total cancer incidence) and 723 000 deaths (9% of total cancer mortalities) in 2012 (Stewart & Wild, 2014).

2.1.3.5 Leukemia

Leukemia is a cancer of the bone marrow and blood and is classified into four main groups according to cell type and rate of growth: acute lymphocytic (ALL), chronic lymphocytic (CLL), acute myeloid (AML), and chronic myeloid (CML) (Leonard, 1993). There were almost 352 000 new cases of leukemia globally in 2012, and about 265 000 deaths. The disease ranks as the 11th most frequent in terms of cancer incidence and the 10th most common cause of cancer death (Stewart & Wild, 2014).

2.1.3.6 Cervical cancer

Cervical cancer originates at the junction between the columnar epithelium of the endo-cervix and the squamous epithelium of the ecto-cervix, a site of continuous metaplastic change, especially at puberty and from after the first pregnancy until menopause. Persistent epithelial infection with one or more oncogenic types of human papilloma virus HPV may lead to the development of precancerous lesions, a small proportion of which may progress to invasive cervical cancer over a period of 10–20 years (Stewart & Wild, 2014).

2.1.3.7 Endometrial cancer

Cancer of the corpus uteri (endometrial cancer) is the sixth most common cancer among women (almost 5% of all cancers in women). There were an estimated 320,000 new cases and 76 000 deaths from the disease in 2012 (WHO, 2012).

2.1.3.8 Ovarian cancers

Finally, Ovarian carcinomas most commonly affects nulliparous women and occurs least frequently among women with suppressed ovulation, typically by pregnancy or oral contraceptives. These tumors are generally considered to originate from the cells covering the ovarian surface or the pelvic peritoneum (Andreoli et al., 2009). Ovarian cancer is the seventh most common cancer among women worldwide (18 most common cancer overall), with 239,000 new cases diagnosed in 2012 (WHO, 2012).

2.1.4. Risk factors of cancer among women

Many risks factors contribute to increase cancer rates among women. These factors include: age, environmental factors, lifestyle, infection, reproductive history and family history.

i. Age

Cancer has a strong relationship with age. Many cancers among women increases with age such as breast, endomatium, ovarian and colon cancer (Andreoli et al., 2009). On the other hand, cervical cancer has relatively earlier age at onset (Stewart & Wild, 2014).

ii. Environmental factors

Numerous environmental factors increase the risk of developing cancer. For example, tobacco smoke contains carcinogens that substantially increase the risk of developing cancers of the lungs, mouth, throat, esophagus, kidneys, and bladder (Andreoli et al., 2009).

Pollutants in the air or water, such as asbestos, industrial waste, or cigarette smoke, can increase the cancer risk. For example, asbestos exposure may cause lung cancer and mesothelioma (cancer of the pleura). Exposure to pesticides is associated with a higher risk of some types of cancer (for example, leukemia and non-Hodgkin lymphoma) (Bruce et al., 2015).

Exposure to radiation is a risk factor for the development of cancer. Extended exposure to ultraviolet radiation, primarily from sunlight, causes skin cancer. Ionizing radiation is particularly carcinogenic. Also women who had radiation therapy to the chest (including

the breasts) before 30 years of old have an increased risk for breast cancer throughout their lives (Nee, 2013).

iii. Lifestyle

Substances consumed in the diet can increase the risk of cancer among women. For instance, a diet high in unsaturated fat has been linked to an increased risk of colon, breast cancer (Bruce et al., 2015). Also, diet high in smoked and pickled foods or in barbecued meats increases the risk of developing stomach cancer. Additionally, dietary intake of salt has been associated with increased incidence and mortality of stomach cancer (Guggenheim & Shah, 2013). Also, women who drinks alcohol has a greater risk for breast cancer (Nee, 2013).

Regarding physical inactivity, World-wide physical inactivity is estimated to cause around 21–25% of breast and colon cancer burden (Stevens, 2009) and women who are physically inactive throughout their life have increasing risk for breast cancer (Nee, 2013).

For obesity, the latest world cancer report from World Health Organization (2014) stated that women who are overweight or obese have a higher risk of cancer of the breast, lining of the uterus (endometrial cancer), colon, kidneys, and esophagus cancer (Stewart & Wild, 2014).

iv. Drugs and medical treatments

Certain drugs and medical treatments may increase the risk of developing cancer among women. For example, estrogens in oral contraceptives may slightly increase the risk of breast cancer and the hormones that may be given to women during menopause (hormone replacement therapy) also increase its' risk (Bruce et al., 2015). Also, Diethylstilbestrol (DES) increases the risk of breast cancer in women who took the drug and in daughters of these women who were exposed before birth (Andreoli et al., 2009). Tamoxifen, a drug used to treat breast cancer, increases the risk of endometrial cancer. Long-term use of testosterone or other male hormones (androgens) may slightly increase the risk of liver cancer (Andreoli et al., 2009). Treatment of cancer with certain chemotherapy drugs (alkylating agents) and with radiation therapy may increase the risk of people developing a second cancer years later (Bruce et al., 2016).

v. Infections

Infections among women can lead to cancer. The WHO reported that deaths and unhealthy life years from cervical cancer are caused by human papilloma virus infection from unsafe sex (Stewart & Wild, 2014).

For specific cancer sites, more than three quarters of deaths from mouth and oro-pharynx cancer, liver cancer, lung cancer and cervical cancer can be explained by infections, and environmental and behavioral exposures. For example, 63% of stomach cancer deaths are caused by infection with Helicobacter pylori, 73% of liver cancer deaths are caused by infection with viral hepatitis or liver flukes, and 100% of cervical cancer deaths are caused by infection with human papilloma virus (Stevens, 2009).

vi. Reproductive history:

Reproductive history associated with increased risk of breast cancer. The risk factors for breast cancer include: nulliparity or lower parity**,** younger age at first menstrual period**,** older age at first live birth and older age at menopause (Bevers et al., 2014). Also, women who used combined estrogen and progesterone hormonal therapy more than five years have an increased chance of developing breast cancer (Nee, 2013). On the other hand, hormone-replacement therapy (HRT) and estrogen exposure based on women menopausal status may increase their risk for colon cancer (Freedman et al., 2009). In addition, early menarche is associated with increased risk of ovarian cancer (Gong et al., 2013).

vii. Family history

Risk of cancer is also increased by a family history of cancer. For example, women who have sister with breast cancer associated with increased risk of breast cancer (Rebora et al., 2008). Also, inherited mutations (genetic alterations) in BRCA1 and BRCA2, the most well-studied breast cancer susceptibility genes, account for 5%-10% of all female breast cancers, an estimated 5%-20% of male breast cancers, and 15%-20% of familial breast cancers (American Cancer Society, 2016a). Meanwhile, lifetime risk of developing ovarian cancer reported to be 15%-45% with *BRCA1* and 10%-20% with *BRCA2* mutation in ovarian cancer and all patients with *BRCA1* or *BRCA2* mutations had high-grade serous ovarian cancer (Schrader et al., 2012).

2.1.5. Treatment of cancer :

There are many types of cancer treatment, the type of treatment depend on the type of cancer and how advanced it is (Andreoli et al., 2009). Several new trends in cancer treatment worldwide are used, but in Palestine the only available treatments are the basic types which are:

Chemotherapy

The term chemotherapy refers to the use of cytotoxic agents singly or in combination for the systemic treatment of cancer. Usually, patients need several chemotherapy treatment visits according to their treatment schedule which most of the time are three weeks apart (NCI, 2015). Certain types of chemotherapy often have specific side effects, but each person's experience is different including : fatigue, headaches, muscle pain, stomach pain, shooting pains (usually in the fingers and toes), mouth and throat sores, diarrhea or constipation, nausea and vomiting, appetite loss, hair loss and low immunity (ASCO, 2015).

Radiation

More than half of all cancer patients receive radiation therapy at some point during the course of their disease. Unlike surgery, regional treatment with radiation can preserve organ structure and function, resulting in enhanced quality of life for patients (Andreoli et al., 2009).

High doses of radiation are used to destroy cancer cells. Side effects occur because radiation can also damage healthy cells and tissues near the treatment area (Walker et al. , 2010). Normal tissue responses to radiation therapy cancer acute or late. Acute effects occur within days to weeks of radiation and are seen in rapidly proliferating tissues such as skin and gastrointestinal mucosa. These effects include diarrhea or constipation, bone abnormalities and chest or eye infections. Late effects such as necrosis fibrosis or organ failure appears after months or years of radiation (Andreoli et al., 2009).

Surgery

Surgery is the primary method of treatment of most isolated solid cancers and may play a role in palliation and prolongation of survival. It is typically an important part of making the definitive diagnosis and staging the tumor as biopsies are usually required (NCI, 2015).

Side effects of cancer surgery may include pain, fatigue, appetite loss ,swelling around the site of surgery, drainage from the site of surgery, bruising around the site of surgery and organ dysfunction which are usually temporary, and all generally goes away as the healing process proceeds. In addition, lymphedema (lymph collection at site of lymph node dissection), Organ dysfunction and changes in body image are common cancer surgeries side effects that patients may feel insecure about and make them struggle with their self-image and lead to emotional side effects which may eventually affect the patients' well-being (Walker et al., 2010).

Palliative care

Palliative care is an integral part of treatment of cancer, particularly in non-curative settings. Palliative care in treating cancer addresses not only physical symptoms, in particular pain syndromes, but also psychosocial and spiritual concerns. Chemotherapy and radiotherapy can be employed with palliative intent and can improve quality of life of patients with cancer (Andreoli et al., 2009).

Palliative care is defined by the World Health Organization as an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual (WHO, 2016).

In most of the world, the majority patients with cancer are in advanced stages of cancer when first seen by a medical professional. For them, the only realistic treatment option is pain relief and palliative care. Effective approaches to palliative care are available to improve the quality of life for patients with cancer (WHO, 2016). Cancer diagnosis, cancer treatment with different types of modalities and cancer prognosis may adversely affect the quality of life of patients with cancer.

2.2. Quality of life of patients with cancer

2.2.1. Introduction

Quality of life (QOL) is a popular term that conveys an overall sense of well-being, including aspects of happiness and satisfaction with life as a whole. It is broad and subjective rather than specific and objective (CDC, 2012).

Quality of life (QOL) is defined as " an individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships and their relationships to salient features of their environment (WHO, 1997a).

The concept of health-related quality of life (HRQOL) and its determinants has evolved since the 1980s to encompass those aspects of overall quality of life that can be clearly shown to affect health—either physical or mental (Robert et al., 1999). On the basis of a synthesis of the scientific literature and advice from its public health partners, the CDC has defined Health related quality of life HRQOL as "an individual's or group's perceived physical and mental health over time." At individual's level, this includes physical and mental health perceptions and their correlates, including health risks and conditions, functional status, social support and socioeconomic status (CDC, 2012).

Generally, HRQOL covers the subjective perceptions of the positive and negative aspects of cancer patients' symptoms, including physical, emotional, social, and cognitive functions and, importantly, disease symptoms and side effects of treatment (Leplège & Hunt, 1997)

While there is an increasing evidence for the value of HRQOL assessment, one of the most difficult tasks is actually measuring it as HRQOL is subjective and can prove a challenge to measure (Leplège & Hunt, 1997). Many of the components, such as social functioning and spirituality, cannot be directly observed. Therefore, these are measured using classical measurement paradigms. The measurement process draws on many different disciplines, including psychology and statistics (Andrew, 2002).

Ferrell model in measuring quality of life is widely used as it looks to QOL in four domains (Ferrell, 1996) :

- Physical well-being: which is the control or relief of symptoms and the maintenance of function and independence.
- Psychological well-being, and it is the attempt to maintain a sense of control in the face of life-threatening illness characterized by emotional distress, altered life priorities, and fear of the unknown, as well as positive life changes.
- Social well-being is the effort to deal with the impact of cancer on individuals, their roles and relationships.
- Spiritual well-being which is the ability to maintain hope and derive meaning from the cancer experience, which is characterized by uncertainty.

Each aspect of quality of life is described in more details as the following:

i. Physical Well-Being

Cancer survivors describe several problematic physical effects that influence their ability to function and negatively influence their overall QOL. The most common effects affecting physical well-being are pain and fatigue. Pain most often occurs in advanced stages of the disease and is related to bone metastasis and compression of adjacent nerves, vascular structures and soft tissue, but it also occurs in non-metastatic disease and may be related to incisional pain, paresthesia, edema, and phantom limb sensations (Andreoli et al., 2009). For example, pain was highly correlated with QOL scores, and the change of pain scores was associated with significant change in patients' QOL (Thienthong et al., 2006).

Fatigue is a prevalent and disturbing symptom of cancer treatment that has been largely ignored because it is not considered life-threatening. Pain and fatigue have often been reported to be the most common symptoms in long-term cancer survivors. Many other symptoms also occur such as menopausal symptoms in breast cancer survivor which are an example of disease/treatment-specific problems related to physical well-being (Ferrell et al., 1997).

Also patients with cancer especially women with breast cancer is prone to insomnia for various reasons including a possible disruption of sleep due to increased frequency and severity of hot flashes associated with the breast cancer treatment, and possible increased depression, anxiety and fatigue levels following the breast cancer diagnosis (Kryger,

2004). It was reported that up to 75% of women with breast cancer experienced problems in falling asleep or maintaining sleep, whereas a smaller group meet the criteria for insomnia (Fiorentino & Ancoli, 2006).

For other cancer related symptoms, nausea and vomiting occurred in 30% (to 60% of patients with cancer and resulting in decrease the quality of life of patients with cancer (Shoemaker et al., 2011). Causes of nausea and vomiting include chemotherapy, radiation therapy, and other medications; infection; anxiety; constipation; bowel obstruction; organ failure; electrolyte disturbances; impaired gastric emptying; gastric/esophageal irritation; and brain metastases (Stephenson & Davies, 2006). Along with nausea and vomiting, patients with advanced cancer frequently report constipation (50%), especially if they are being treated with opioids (Shoemaker et al., 2011).

ii. Psychological Well-Being

The most problematic changes affecting QOL in the psychological domain include: anxiety; fear of recurrence, secondary or metastatic malignancies, concern over future tests and distress over recall of the initial cancer treatment. These changes in psychological well-being are manifested by marked anxiety, mood swings, and depression (Ferrell et al., 1997).

Despite the widely reported problems of fear of recurrence and uncertainty over the future and the need for interventions to help cancer survivors to manage these concerns, only few have been tested. Support groups have traditionally been found to provide the necessary emotional support and help patients cope with the fear of dying (Ferrell et al., 1997). For example, a multicenter randomized- control trial performed in Canada (2001) and included 235 women with metastatic breast cancer that were randomly assigned either to intervention group that participated in weekly supportive–expressive group therapy (158 women) or to a control group that received no such intervention (77 women). Women assigned to supportive–expressive therapy had greater improvement in psychological symptoms and reported less pain than women in the control group (Goodwin et al., 2001).

Interventions to improve both physical and psychological well-being have become even more imperative as recent advances in cancer treatment have extended the length of cancer survivorship. Cancer survivors require attention to these important needs in order to resume employment or carry on roles and responsibilities. Both the physical and

psychological domains are often neglected in long-term survivorship when patient's encountering with the health-care system become less frequent. Psychological support for long-term survivors is of special concern and is at particular risk amidst the current reductions in health-care delivery (Ferrell et al., 1997).

iii. Social Well-Being

Quality-of-life concerns affecting social well-being include family issues, such as sexual and marital problems and adjustment of children, and work-related issues, such as concern over cancer disclosure, stigma, reentry into the workplace, changes in work priorities, discrimination and health insurance. Also the long-term impact of cancer may affect patient's family and work. As a result, specific interventions were described to alleviate social problems related to QOL of patients with cancer including coaching support, work-site educational programs, and family counseling and intervention (Northouse, 1994).

iv. Spiritual Well-Being

Finally, QOL factors affecting spiritual well-being include: spiritual distress, grief and loss. A link between religiosity and spiritual support with recovery from breast cancer has been reported; a sense of hopefulness and having a purpose in life were also important aspects influencing spiritual well-being (O'Connor, 2007).Religion might have affected patients with cancer quality of life positively as patients who practiced religious ritual levels had better quality of life than those didn't (Tarakeshwar et al., 2006; Üstündag & Zencirci, 2015).

2.2.2 Measuring Quality of life

In an attempt to examine "quality of life" as a specified construct in cancer survivors, some investigators have administered instruments designed specifically to assess multiple and varied aspects, or qualities, of cancer survivors' such as the European Organization for the Research and Treatment of Cancer (EORTC) – C30 Questionnaire which is widely-used in quality of life research and have well-established norms derived from adult cancer populations. In addition, the Quality of Life – Cancer Survivors (Ferrell et al., 1995) and the Quality of Life Index – Cancer (Ferrans & Powers, 1995) which have received less exposure and psychometric analysis. All of these instruments typically assess physical,

psychological, social and spiritual/existential domains, and address concerns regarding health status and physical function, sexuality and fertility, emotional distress, future outlook, school and work performance, social and family relationships, and spirituality, as well as other key medical, demographic and psychosocial elements (Andrew, 2002).

Many studies were conducted to assess the quality of life of patients with cancer using The EORTC quality of life core questionnaire (QLQ-C30). For example, a Kuwaiti study measured the quality of life (QOL) of 348 patients with breast cancer aged between 20–81 years attended chemotherapy treatment sessions at the Kuwait Cancer Control Center using (EORTC QLQ-C30) questionnaire. The study showed that the mean scores for QLQ – C30 (GQOL, 45.3; and five functional scales, 52.6–61.2) indicating that the patients had poor to average functioning, and 5.8% to 11.2% had scores that met the ≤33% criterion for problematic functioning, while 12.0% to 40.0% met the >66% criterion for more severe symptoms. In addition, between 47.8% and 70.1% met the >66% criterion for "good functioning" on the functional scales. These results provided an evidence to boost national health education about psychosocial prognosis in cancer, and to enhance the practices of clinicians treating women with breast cancer towards preparing them for the acute toxicities of treatment and address fatigue. The findings call for the institution of a psycho-oncology service to address psycho-social issues (Alawadi & Ohaeri, 2009).

The same QOL assessment questionnaire (EORTC QLQ-C30) was used to assess QOL patients with cancer aged 15 years of old and above in three major cancer treatment centers in the West Bank include: Beit-Jala Governmental Hospital in Bethlehem, Augusta Victoria Hospital in Jerusalem and Al-Watani Hospital in Nablus. The study used a convenient sample of 323 patients with cancer, 62.2% (n=201) were recruited from Beit-Jala Hospital, 29.7% (n=.96) from Augusta Victoria Hospital and 8% (n=26) from Al-Watani Hospital. While, 58.2% (n=188) of the study participants were females, 31% (n=102) of the participants had breast cancer. The study showed that the mean scores for QLQ – C30 of (GQOL= 41.8) and five functional scales between 46 and 50, indicating that the patients had poor functioning. Meanwhile,13.2% to 33.8% had scores that met the </= 33% criterion for problematic functioning, 14.4% to 62.1% met the >66% criterion for more severe symptoms and 59.2% met the ≥ 66% criterion of symptom severity for fatigue and pain respectively. The results Indicated a need to assess psychological aspects of QOL of patients with cancer in the West bank (Khleif & Imam, 2013).

Finally, another study was conducted to assess the physical, psychological and spiritual and social well-being among women with breast cancer in Palestine using Ferrell quality of life assessment tool. The sample consisted of 108 women aged between 30 and 70 years of old with breast cancer who were attending oncology clinics during June through August 2008 from the oncology departments at the governmental hospitals and in non-governmental organization. The linear transformation of the study results to be compared with EORTC quality of life results showed that the mean score of GQOL was 49% and the means of the measured functional scales include: physical, social and emotional functions were 55.4%, 45.8% and 44% respectively (Samara & Saca, 2009).

2.2.3 Factors affecting quality of life among patients with cancer

Numerous studies have identified several factors influencing quality of life (QOL) in patients with cancer. Generally different socio-demographic variables were studied including gender, age, marital status and educational level. For women with cancer especially breast cancer, different treatment modalities, psychological distress-anxiety related to cancer diagnosis and treatment, symptoms such as pain, fatigue, supportive care-clinical treatments and sexual functioning problems after breast cancer diagnosis especially younger patients and their relationship on quality of life of women with cancer were studied (Montazeri, 2008).

For example, a large study was conducted in Harvard School of Public Health in USA to explore the changes in physical and psychosocial function before and after breast cancer by age at diagnosis. A total of 122,969 women from the Nurses' Health Study (NHS) aged 29 to 71 years, who responded to pre- and post-functional status assessments were included from which 1,082 women were diagnosed with breast cancer. The results showed that women with breast cancer experienced significant functional declines, where young (age <40 years) women who developed breast cancer experienced the largest relative declines in HRQOL (as compared with middle-aged and elderly women) in multiple domains including physical roles, pain , social functioning psychosocial dimensions after breast cancer diagnosis (Kroenke et al., 2004).

Also, a cross-sectional study was conducted to measure the QOL in 200 patients with solid tumors at different chemotherapy cycles (CT) by using (EORTC QLQ-C30) questionnaire.

One hundred woman with cancer aged 18-75 participated in this study and the results showed a significant relationship between the cancer type, pain intensity, and fatigue and none of the demographic variables (age, education, marital status, income) and QOL. Nevertheless, significant difference was found between the level of QOL in patients with <2 CT cycles and/or with 3-5 cycles ($p< 0.001$) (Heydarnejad et al., 2011).

Another study examined common symptoms such as pain intensity, fatigue and depression and their ability to predict QOL. A total of 114 oncology outpatients, including 34 males and 80 females, completed a demographic questionnaire, the Multidimensional Quality of Life Scale - Cancer, a Depression Scale, and a numeric rating scale for pain intensity. The finding showed that female patients reported significantly lower psychological dimension of QOL than their male counterparts ($p=0.009$). Also for the females, a significant negative correlation was found between pain intensity and QOL ($p<0.0001$), as well as significant positive correlations between pain intensity and fatigue ($p<0.0001$) and depression. Stepwise linear regression analyses showed that among the females, QOL was significantly predicted by pain intensity as well as by depression. However, among the males, depression was the only symptom found to predict QOL. The study concluded that gender should be considered as an additional feature for further characterizing QOL. Gender differences in factors predicting QOL warrant different clinical approaches to male and female patients, and identifying these differences may assist health care providers in tailoring treatment modalities to individual patients for optimal outcomes (Pud, 2011).

In addition, a study was conducted to examine the impact of various medical and demographic factors on the quality of life (QOL) of patients with breast cancer was performed as a routine follow up for these patients .Two -hundred and seventy-four women with breast cancer were evaluated by using the QLQ-C30 questionnaire Version 2.0 and a hypothesized psychological scale structure of the added items included a body image scale, satisfaction with the primary surgical treatment, fear of recurrence and cosmetic results. The results showed minor impairment of QOL (mean 67.8) and body image (mean 24.8), but more fear of recurrence (mean 60.7). None of the studied factors such as age, tumor stage, treatment factors and follow up period had a significant impact on overall QOL according to the QLQ-C30 questionnaire. In contrast, with the exception of the treatment factors which included ‘cytotoxic therapy’ and ‘radiotherapy’ influenced at least one of the psychological scales used in the study (Härtl et al., 2003).

It was found that various types of psychological interventions are associated with significant effects on quality of life of adult patients with cancer (Faller et al., 2013). In patients with breast cancer, high psychological stress was associated with low physical and psychological quality of life highlighted the importance of studying psychological stress in female patients with cancer to improve their QOL (Golden-Kreutz et al., 2005).

Recently there is a focus increasingly on potential post-traumatic stress disorder (PTSD) diagnosis or symptomatology following cancer. The latter may signal threat to life and body integrity including possible disfiguration, disability, pain, and loss of social and occupational roles. The uncertainty of outcome, experienced lack of control, and suddenness of the diagnosis may elicit intense emotions including fear and helplessness, as with single-event traumas, but the protracted, chronic, and multifaceted nature of cancer adds psychological complexity (Gurevich et al., 2002).

Different aspects of the cancer experience might trigger PTSD from being diagnosed with the disease or diagnosis of an advanced cancer to painful tests and treatments, pain from the cancer itself or other physical issues ,long hospital stays or treatments and cancer recurrence (cancer that comes back after treatment) or the potential for recurrence (NCI, 2015).

The next section will discuss PTSD symptoms among patients with cancer in more details.

2.3. PTSD symptoms in patients with cancer

Assessing PTSD symptoms in patients with medical diagnoses is becoming increasingly common, particularly since the inclusion in Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) of a diagnosis with a life-threatening illness as a traumatic event that could precipitate PTSD (Josephine E.& Nicholas, 2003).

American Psychiatric Association in its fifth edition of *Diagnostic and Statistical Manual of Mental Disorders*- DSM-V defined PTSD as: the development of characteristic symptoms following exposure to an extreme traumatic stress or involving direct personal exposure to actual or threatened death, serious injury or sexual violation. The exposure must result from one of following scenarios: the individual has directly experiences the traumatic event or indirectly by learning that a close relative or close friend was exposed to

trauma, or witnesses the traumatic event in other person (American Psychiatric Association, 2013).

In DSM-IV, the person's response to the event must involve intense fear, helplessness, or horror (or in children, the response must involve disorganized or agitated behavior). The characteristic symptoms resulting from the exposure to the extreme trauma include persistent re-experiencing of the traumatic event , persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, and persistent symptoms of increased arousal . The full symptom picture must be present for more than 1 month, and the disturbance must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning (American Psychiatric Association, 2000).

However, DSM-V pays more attention to the behavioral symptoms that accompany PTSD and proposes four distinct diagnostic. They are described as re-experiencing, avoidance, negative cognitions and mood, and arousal. *Re-experiencing* covers spontaneous memories of the traumatic event, recurrent dreams related to it, flashbacks or other intense or prolonged psychological distress. *Avoidance* refers to distressing memories, thoughts, feelings or external reminders of the event. *Negative cognitions* and mood represents myriad feelings, from a persistent and distorted sense of blame of self or others, to estrangement from others or markedly diminished interest in activities, to an inability to remember key aspects of the event. Finally, *arousal* is marked by aggressive, reckless or self-destructive behavior, sleep disturbances, hypervigilance or related problems. The current manual emphasizes the “flight” aspect associated with PTSD (American Psychiatric Association, 2013).

Although PTSD is most often associated with traumatic events such as war, sexual and physical attacks, natural disasters and serious accidents, the disorder can also affect people with a history of cancer (NCI, 2015).

It emerges from the literature that up to 19% of adults women receiving breast cancer diagnosis present a PTSD-like syndrome (Kwakkenbos et al.,2014). On the other hand, early detection of PTSD symptoms among female patients with cancer can help in improving psychological health of patients with cancer as well as QOL and medical prognosis. Therefore, it is important to detect PTSD symptoms to guide health care interventions as early as possible (Lutgendorf et al., 2012).

2.4 Studies that assessed PTSD and QOL among patients with cancer

Post-traumatic stress had been measured in a variety of cancers including melanoma, Hodgkin lymphoma, breast cancer and mixed cancers. The incidence rates have varied accordingly; The incidence of PTSD diagnosis ranges from 3% to 4% in early-stage patients recently diagnosed to 35% in patients evaluated after treatment (NCI, 2015b).

For example, a case control study was conducted in Germany to test the hypothesis that pretreatment cognitive impairment is attributable to cancer-related post-traumatic stress. Cases were women aged 65 years or younger who were diagnosed with breast cancer and controls were patients undergone negative routine breast imaging at one of six participating breast centers underwent traditional and computerized neuropsychological testing, clinician-administered diagnostic assessment of stress disorders (CAPS) , and self-report assessments of cognitive function and depression. Results of 166 case patients and 60 well-matched controls showed that prior to any treatment, patients with breast cancer may show limited cognitive impairment that is apparently largely caused by cancer-related post-traumatic stress (Hermelink et al., 2015).

Furthermore, Alter et al.(1996) conducted a study to assess PTSD in cancer survivors in USA. The study used CAPS tool and interviewed 27 breast cancer survivors. Only one woman representing (4%) of the sample meet the criteria for PTSD diagnosis (Alter et al., 1996).

Also, a prospective study measured the prevalence of acute and post-traumatic stress disorder and comorbid mental disorders in patients with breast cancer during primary cancer care. Screening measures were used to assess post-traumatic stress responses, anxiety, and depression at first time and at 6 months follow-up assessments included screening instruments for Acute Stress Disordered (ASD) and PTSD by using the IES-Revised (IES-R) and the PTSD Checklist-Civilian (PCL-C) tools. The screening instruments IES-R and PCL-C identified PTSD in 18.5% of participants at the first assessment and in a range of 11.2% to 16.3% of participants at the second assessment. However, only 2.4% of participants met the criteria for mild to moderate cancer-related PTSD and 2.4% were diagnosed with ASD (Mehnert & Koch, 2007).

Also, a variety of socio-demographic, disease-related, psychosocial and psychological variables have been investigated to determine their relationship to post-traumatic stress disorder (PTSD) in patients with cancer. Demographic variables that have been associated

with a higher incidence of PTSD include younger age ,fewer years of formal education, and lower income (Alkhyatt et al., 2012; Cordova et al., 1995).

A large study was conducted to assess the prevalence and the risk factors for cancer-related PTSD symptoms in a nationwide inception cohort of women treated for primary breast cancer. In this study 3343 Danish women with primary breast cancer completed a questionnaire at 3 months post-surgery and a follow-up questionnaire at 15 months post-surgery. The questionnaire included the impact of event scale (IES) to measure PTSD. The findings showed that 20.1% of the sample had total scores suggesting severe PTSD symptoms at 3 months post-surgery, compared with 14.3% at 15 months. In all, 48% with severe PTSD symptoms at 3 months also had scores above the cutoff at 15 months. Main predictors of severe PTSD symptoms at 15 months were low social status, previous physical and mental illness, axillary lymph node involvement (>3), and reduced physical functioning (PF) at 3 months (O'Connor et al., 2011).

In addition, a follow up study was conducted to measure posttraumatic stress symptoms in patients with breast cancer. In this study one -hundred and two female patients with breast cancer aged 18 years or older were evaluated during their preoperative visit to the outpatient clinic of the department of surgery for posttraumatic stress symptomatology at different stages of non-metastatic cancer diagnosis and treatment: during treatment, at the end of treatment, and at a 6–12 months follow-up. PTSD symptoms were measured using the Impact of Event Scale-Revised (IES-R). The study results indicated that PTSD symptoms remained constant across all phases. There were significant correlations between PTSD symptoms and other psychosocial variables and age in favor of younger age groups, but not with other socio-demographic or medical factors (Perez et al., 2014).

Further, a study conducted to determine the prevalence of post-traumatic stress symptoms in a sample of cancer survivors and showed that 7–29% of the sample reported symptoms related to PTSD, depending on scoring method used – using different cut-off point. Results also showed that none of the cancer history variables (treatment type, time since treatment, childhood cancer survivor, and multiple cancer diagnoses) had significant associations with the PCL-C total score. Age, race/ethnicity, income, marital status, health-related quality of life and psychosocial variables (social support, depressive symptoms) were all statistically significantly associated with the PCL-C total score. The study concluded that

assessing cancer survivors for PTSD symptoms with the PCL-C could detect those individuals in need of psychosocial support (Hahn et al., 2015).

Cordova et al. assessed the quality of life (QOL) and PTSD-like symptoms in 55 women post treatment for breast cancer. PTSD symptom measures included the PCL-C and IES. QOL was assessed using the 20-item Medical Outcomes Study Questionnaire. PTSD symptomatology was negatively related to QOL, income, and age. While time since treatment, type of cytotoxic treatment, and stage of disease were unrelated to PTSD symptoms. With suggested criteria for the PCL-C, 5% to 10% of the sample would likely meet DSM-IV PTSD criteria. Findings suggest that in survivors of breast cancer, these symptoms might be fairly common, may exceed the base rate of these symptoms in the general population, are associated with reports of poorer QOL, and, therefore, warrant further research and clinical attention (Cordova et al., 1995).

Finally , a large study was conducted in Germany to measure psychosocial co-morbidity (such as PTSD) and quality of life (QOL) and their association with each other and to assess the need for psychosocial support in long-term breast cancer survivors. In this study one thousand eighty-three patients responded to self-reported measures included a depression Scale, posttraumatic stress disorder checklist and QOL assessment tool. Posttraumatic stress disorder was observed in 12% in the participants. Meanwhile, disease progress, less social support, a lower educational level, and younger age were predictors of psychological co-morbidity with a significant impact of psychological co-morbidity on QOL of these patients with breast cancer (Mehnert & Koch, 2008).

In summary, the previous studies showed that there is a relationship between quality of life of patients with cancer and PTSD occurrence.

2.5. Summary:

This chapter presented the worldwide prevalence of most common cancer types among women. The latest WHO statistics showed that breast cancer, lung cancer and colorectal cancer are the top three cancer types diagnosed in females. Also, Palestinian ministry of health statistics (2014) showed that breast cancer was the most common cancer diagnosed among women in the west bank followed by colon and lung cancer. Cancer types, stages and treatment were also defined in this chapter.

QOL has become increasingly common in cancer research. Ferrel et al. (1995) demonstrated four domains for quality of life : physical, psychological, social and spiritual. Many studied assessed different domains of QOL using different instruments which generally showed low quality of life among patients with cancer.

Finally, studies showed that PTSD symptoms were prevalent in patients with cancer and lead to negative impact on quality of life of patients with cancer

The next chapter discussed the conceptual framework of the current study.

Chapter Three

Conceptual framework

3.1. Introduction

Conceptual framework is a tool structured from a set of broad ideas and theories taken from relevant fields of enquiry that help researchers to properly identify the problem they are looking at, guide their inquiry, frame their questions and find suitable literature. Most academic researchers use a conceptual framework at the outset because it helps the researcher to clarify his/her research question and aims (Smyth, 2004). It can be a visual or written product that is explained either graphically or narrative (Polit & Beck, 2004).

Also, conceptual framework has different purposes. It helps researchers to see the variables of the study clearly, it provides researchers with a general framework for data analysis, and it is essential in the preparation of a research proposal using cross sectional design methods. The conceptual framework also summarizes the major dependent and independent variables in the research, and it gives direction to the study (Smyth, 2004).

The major concepts of the current framework focus on quality of life and PTSD symptoms as dependent variables and other variables as independent variables such as the socio-demographic data (which includes age, place of residence, educational level, economic and marital status), cancer medical history which includes type of cancer, cancer treatment and onset since diagnosis and psychological history include: previous psychological problems, psychological treatment and self-harming.

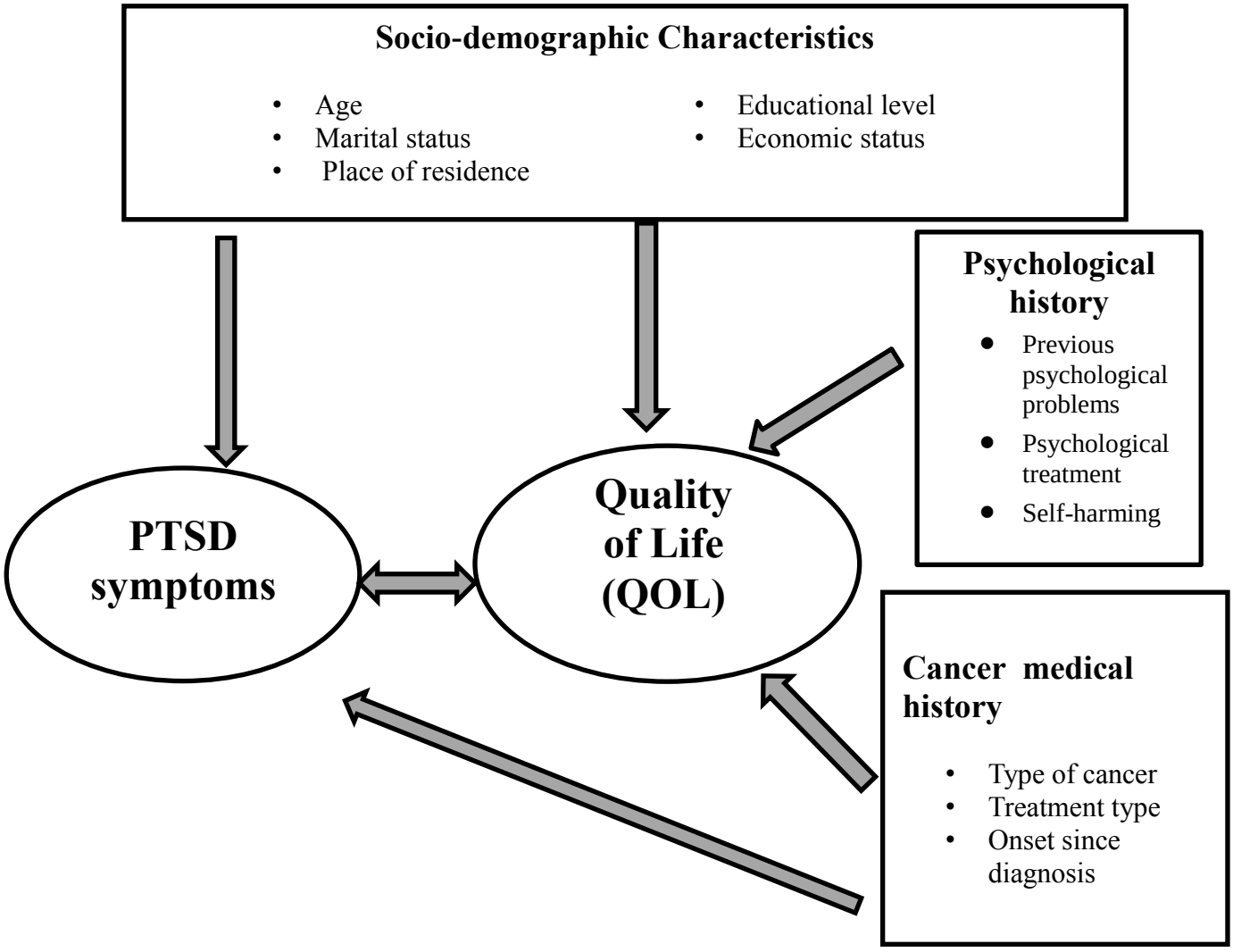


Figure (3.1) Conceptual framework of the study. Each concept will be discussed in more details below.

3.2 Dependent variables:

There were two dependent variables in the current study which are quality of life and PTSD symptoms.

3.2.1 Quality of life

As discussed in chapter two ; Quality of life (QOL) is defined as " an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns, It is a broad-ranging concept affected in a complex way by the person's physical health , psychological state , level of independence , social relationships , and their relationships to salient features of their environment (WHO, 1997a). The CDC has defined Health related quality of life (HRQOL) as "an individual's or group's perceived physical and mental health over time" (CDC, 2012).

In cancer, QOL has been defined as a personal sense of well-being encompassing a multidimensional perspective that generally includes physical, psychological, social, and spiritual dimensions or domains (Ferrell et al., 1995).

Quality of life is assessed in the current study by using the "European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30). It incorporates nine multi-item scales: five functional scales (physical, role, cognitive, emotional and social Functioning), three symptom scales (fatigue, pain and nausea/vomiting) and a global health status (GQOL). Six single item scales are also included (dyspnea, insomnia, appetite Loss, constipation, diarrhea and financial Difficulties) (EORTC, 2001).

EORTC group provides a scoring manual which includes the operational definitions of all domains which include (physical, role, cognitive, emotional and social functioning), symptom scales (fatigue, pain and nausea/vomiting) and a global health status (GQOL). Definitions of single item scales which are: dyspnea, insomnia, appetite Loss, constipation, diarrhea and financial difficulties) are also included in EROTC manual (Aaronson et al., 1993).

Physical function (PF) was assessed by the following questions in the questionnaire (see appendix III).

Q1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?

Q2. Do you have any trouble taking a long walk?

Q3. Do you have any trouble taking a short walk outside of the house?

Q4. Do you need to stay in bed or a chair during the day?

Q5. Do you need help with eating, dressing, washing yourself or using the toilet?

Role function (RF) was assessed by the following questions in the questionnaire (see appendix III).

Q6. Were you limited in doing either your work or other daily activities?

Q7. Were you limited in pursuing your hobbies or other leisure time activities?

Social functioning (SF) was assessed by the following questions in the questionnaire (see appendix III).

Q26. Has your physical condition or medical treatment interfered with your family life?

Q27. Has your physical condition or medical treatment interfered with your social activities?

Emotional functioning (EF) was assessed by the following questions in the questionnaire (see appendix III).

Q21. Did you feel tense?

Q22. Did you worry?

Q23. Did you feel irritable?

Q24. Did you feel depressed?

Cognitive functioning (CF) was assessed by the following questions in the questionnaire (see appendix III).

Q20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?

Q25. Have you had difficulty remembering things?

Symptoms scale were assessed by the following questions in the questionnaire (see appendix III).

Pain

Q9. Have you had pain?

Q19. Did pain interfere with your daily activities?

Fatigue

Q10. Did you need to rest?

Q12. Have you felt weak?

Q18. Were you tired?

Nausea and vomiting

Q14. Have you felt nauseated?

Q15. Have you vomited?

Dyspnea

Q8. Were you short of breath?

Insomnia

Q11. Have you had trouble sleeping?

Loss of appetite

Q13. Have you lacked appetite?

Constipation

Q16. Have you been constipated?

Diarrhea

Q17. Have you had diarrhea?

Financial impact was assessed by the following question in the questionnaire

Q28. Has your physical condition or medical treatment caused you financial difficulties?

Global Quality of life (GQOL) was assessed by the following questions in the questionnaire (see appendix III).

Q29. How would you rate your overall health during the past week?

Q30. how would you rate your overall quality of life during the past week?

3.2.2 PTSD symptoms :

As mentioned previously, PTSD symptoms are the characteristic symptoms following exposure to an extreme traumatic stress involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate. These symptoms include persistent re-experiencing of the traumatic event , persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness, and persistent symptoms of increased arousal. The full symptom picture must be present for more than 1 month (American Psychiatric Association, 2013).

Psychometric assessment of PTSD provides quantitative assessment of the degree of PTSD symptom severity. Psychometric instruments are typically present in a self-administered format (i.e, the participant read the item and record the response without the intervention

of the interviewer) (Preston John & Terence Martin, 2004). Judgments about symptom severity can be made by comparing an individual 'scores against norms established on reference samples of individuals who are known to have or not have PTSD. Cutting scores have been established for the psychometric measures of PTSD based on their high sensitivity and specificity in discriminating individuals with PTSD from those without PTSD. Data from psychometric tests never serve as a "stand alone" means for diagnosing PTSD (Watson et al., 2012). The major psychometric instruments are PTSD Checklist (PCL) for individuals exposed to both combat and non-combat forms of trauma, and Mississippi Scale for Combat-Related PTSD (Watson et al., 2012).

PTSD symptoms were assessed in the current study based on PTSD Checklist- specific version (PCL-S). The purpose of PTSD Checklist (PCL) is to examine the psychometric properties of the 17 individual items of PTSD. Weathers et al. reported data on the 3 symptom clusters which make up PTSD (Blanchard et al., 1996). These symptoms are : *re-experiencing* (e.g., flashbacks, intrusive images and sensory impressions, dreams/nightmares); *avoidance* (e.g., avoiding people, situations, or circumstances resembling or associated with the event); and *hyper-arousal* (e.g., hypervigilance for threat, exaggerated startle response, irritability, difficulty concentrating, and sleep problems). These symptoms must cause significant distress or life impairment for a diagnosis to be made (Friedman, & Blanco, 2011).

In PCL checklist questions are categorized as the following (Weathers et al., 1991): (see appendix V)

Re-experiencing the event which includes the following questions:

Q1. Repeated, disturbing *memories, thoughts, or images* of a stressful experience from the past?

Q2. Repeated, disturbing *dreams* of a stressful experience from the past?

Q3. Suddenly *acting* or *feeling* as if a stressful experience *were happening* again (as if you were reliving it)?

Q4. Feeling *very upset* when *something reminded* you of a stressful experience from the past?

Q5. Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful experience from the past?

Avoidance/numbing which includes the following questions :

Q6. Avoid *thinking about* or *talking about* a stressful experience from the past or avoid *having feelings* related to it?

Q7. Avoid *activities* or *situations* because they *remind you* of a stressful experience from the past?

Q8. Trouble *remembering important parts* of a stressful experience from the past?

Q9. Loss of *interest in things that you used to enjoy?*

Q10. Feeling *distant* or *cut* off from other people?

Q11. Feeling *emotionally numb* or being unable to have loving feelings for those close to you?

Q12. Feeling as if your *future* will somehow be *cut short*?

Arousal which includes the following questions::

Q13. Trouble *falling* or *staying asleep*?

Q14. Feeling *irritable* or having *angry outbursts*?

Q15. Having *difficulty concentrating*?

Q16. Being *"super alert"* or watchful on guard?

Q17. Feeling *jumpy* or easily startled?

3.3. Independent variables :

In the current study, independent variables included socio-demographic data (such as age, marital status, place of residency, educational level and economic status), cancer medical history included (type of cancer, cancer treatment and duration since diagnosis) and psychological history.

3.3.1. Socio-demographic variables:

These variables were presented in section one of the questionnaires . Questions number 1 to 5 in the questionnaire were designed to assess these variables as the following (see appendix I).

Age: Which is defined as the completed age in years of the enumerated person, which is the difference between the date of birth and the date of interview. The exact age is the time elapsed between the day of birth and a given day, including parts of a year (PCBS, 2004). In the current study all females with cancer aged 18 and above were recruited ; as this age is considered the age for independency in life , were this age group expect to enjoy life and start families. In the current study, question number (1) assessed this .

Marital status: which is defined as the status of those 12 years old and over in terms of marriage traditions and laws in the country (PCBS, 2012). Marital status in the current study was divided into 4 categories: single**,** married, divorced and widow. Question number (2) assessed this.

Educational level: It referred to the highest successfully completed educational attainment level, the educational level for persons aged 10 years and over (PCBS, 2012).In this study it had 4 categories, and question number (3) assessed this as the following:

i. Illiterate: 0 education.
ii. Primary (1- 6 study years).
iii. Secondary school (7 – 12 study years).
iv. University.

Place of residency: It refers to the name of the locality in which the person spends most of his time during the year (lived there six months and above), irrespective of whether it is the person's same place of existence during the census, or the place in which he works and

performs related activates or the place is his original place (PCBS, 2012). In the current study, a question number (4) assessed this as village**,** camp and city.

Economic status: It defined as cash or in kind revenues for individual or household within a period of time; could be a week or a month or a year (PCBS, 2012). In the current study economic status was categorized into 4 categories depending on monthly income and assessed in question (5) as :

i. No income.
ii. Less than 2000 NIS.
iii. From 2000-4000 NIS.
iv. More than 4000 NIS.

3.3.2. Cancer medical history

Questions number 6 to 8 in the questionnaire were designed to assess these variables including:

Type of cancer :it assessed the site where cancer originated. Cancer can start any place in the body. It starts when cells grow out of control and crowd out normal cells (American Cancer Society,2016). This was assessed in this study in question (6) with open ended question about the location of cancer was used to identify the types of cancer for example: breast , thyroid , gynecological , lymphomas or other types of cancer.

Duration science cancer diagnosis: duration of cancer diagnosis is the length of the disease reckoned since the occurrence of first signs and symptoms that lead to diagnosis (Walshe, 1846). It was assessed in the current study in question (7) which is an open ended question. The question was: how long have you been diagnosed with cancer?

Treatment : as discussed in chapter two, there are many types of cancer treatment, and The type of treatment depend on the type of cancer and how advanced it is (Andreoli et al., 2009). The current study assessed treatments that the participant had undergo from the diagnosis to the time of the study through 4 categories where the participant can choose different options at the same time in question (8). The categories included:

i. Chemotherapy.
ii. Radiotherapy.

iii. Surgery.

iv. Other traditional treatments.

3.3.3. Psychological history

Psychological status was assessed in last seven questions in section one of the questionnaire from question 9 to 15. The questions address the following:

Question number nine is a yes or no question about if the participant had any psychological treatment *before* cancer diagnosis. The question was: Did you go to psychotherapy to treat your psychological problems *before* cancer diagnosis? Yes / No.

Question (10) is an open ended question. It assessed the psychological problem that the participant had before cancer diagnosis. If answered yes to question eleven, the question was: what is your psychological problem that you had seek psychotherapy for?

Question number eleven is also a yes or no question about if the participant had psychological treatment *after* cancer diagnosis, followed by an open ended question (12) if the answer was yes to identify her psychological problem. Question (11) was: Did you go to psychotherapy to treat psychological problems *after* cancer diagnosis? Yes / No. if she answered yes, question (12) was: what is you psychological problem after diagnosis with cancer ?

The question number thirteen assessed the types of psychological treatment that the participant received. Psychological treatment included: different classes of medication prescribed by psychiatrists or by psychotherapy sessions or different other treatments (Nevid, 2012). In the current study psychological treatment was assessed in 3 categories in question (13) which included : medications, psychotherapy sessions, or an open question for any other type of treatment .

The question number fourteen is a yes or no question that assessed if the participant considered harming herself after cancer diagnosis to detect suicidal ideas or attempts. The question was: Did you think about harming yourself after being diagnosed with cancer? Yes / No.

Finally, the question number fifteen was an open ended question that assessed how many times the participant considered harming her-self . if answered yes to question fourteen, the question was: how many did times you try to harm yourself?

3.4 . Summary :

This chapter presented the conceptual framework which was developed based on literature review. It defined two major concepts: the dependent variables which are quality of life and PTSD symptoms and the independent variables including : socio-demographic data (such as age, marital status, place of residency, educational level and economic status), cancer medical history (type of cancer, cancer treatment and duration since diagnosis) and the psychological history.

The next chapter discussed methodology of the current study.

Chapter Four

Methodology

4.1. Introduction

This study aimed to examine quality of life and PTSD among female patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem. To achieve this purpose, a cross sectional design was utilized. This chapter presented the methodology that had been used in the current study.

4.2. Study design

Quantitative research is a formal, objective, rigorous, and systematic scientific process for gathering information or for investigating quantifiable properties, phenomena and relationships. It involves a collection of numerical data where often there is considerable control and analysis of data by using statistical procedures (Burns & Grove, 2011) The objective of quantitative research is to develop and employ mathematical models, theories and hypotheses, and it is used widely in social science such as psychology, social work, sociology, nursing and political science (Polit & Beck, 2004).

In the current study, a cross-sectional design was utilized using self-reported questionnaires because it is highly useful for descriptive purposes, and it shows both the

determining factors and the outcome at the same time. Moreover, it is less expensive and it saves time and effort. On the other hand, the cross-sectional design has many limitations: it does not lend to generalization of the result, it may not enable researchers to make causal inferences, and it is not appropriate for incident estimation especially in the case of long-lasting outcomes (Burns & Grove, 2011).

4.3. Target population

Female patients with cancer aged 18 and above were targeted. Patients were recruited from the oncology outpatient clinics and Day Care Unit, in the Beit-Jala Governmental Hospital in Bethlehem.

Inclusion criteria

- Any female patient with cancer registered in outpatient oncology clinics or Day Care Unit of the oncology department in Beit-Jala Governmental Hospital in Bethlehem regardless of her cancer type or treatment.
- Female patient with cancer aged 18 years old and above.

Exclusion criteria

- Any patient with severe mental problem such as schizophrenia, mania or severe depression because these disorders may affect their ability to fill in the questionnaire.
- Female patients aged below 18 years of old.
- Patients with less than one month of cancer diagnosis as it is not applicable to PTSD diagnosis at this time because the criteria of PTSD diagnosis in DSM-V is eligible if the duration of the event is more than 1 month (American Psychiatric Association, 2013).
- Patients in terminal stages were excluded as these patients are expected to have severe medical and psychological condition that affect their ability to fill in the questionnaire.

4.4. Sample size and sampling approach

Convenient sample method was used in the current study. Convenient sampling uses the most readily available or most convenient group of people for the sample (Polit & Beck, 2004). It was chosen because of the sensitivity of research topic and the health status of participants may affect their participation in the study. Female patients met the inclusion criteria were asked to complete the questionnaire. Data collection was started on April and ended on the end of July, 2015.

There were no formal statistics about the number of female patients with cancer in Beit-Jala Governmental Hospital in the previous years so we approached the hospital Statistical Unit to get data manually about the number of females patients with cancer who were diagnosed from the years 2013, 2014 to April 2015 in order to calculate the sample size. Statistics showed that the number of female patients aged 18 years old and above who were diagnosed with a cancer was (266) patients in the year 2013 and (283) patients in the year 2014. Because they did not have statistical data for the year 2015; we assumed that the expected number of patients who met the inclusion criteria would be the average of the two previous years (2013 and 2014). The total population for the years 2013, 2014 was 549 patients. As data collection started on April , 2015 (quarter of the year) the number of total population would be 69 as shown in table (4.1).

Table (4.1) Number of total population of the current study

Year	Number of female patients with cancer	Total population
2013	266 patient	266+283= **549** patient
2014	283 patient	
2015	549/2=274 patient	
April ,2015	274/4	**69** patients
Total population of the study		**618** patients

For sample size, 40% of the total population was taken in order to get a large sample size which was 253 participants as seen below.

Sample size =	618 * 0.40 =	253 participants

4.5. Setting

The study was held in Beit-Jala Governmental Hospital in Bethlehem. It has 65 doctors and 135 nurses who served 75 thousand case in 2014 (MOH, 2016). Beit-Jala Governmental Hospital is one of the main governmental center for cancer treatment in Palestine. It is the only governmental hospital in south Palestine were all patients with cancer are referred for chemotherapy treatment. The hospital provides also diagnostic procedures such as biopsies and pathological classifications of cancer types and other treatment of cancer including surgery but not radiotherapy (MOH, 2016).

It has 130 beds, distributed into five specialties (medical , surgical, oncology, pediatric and gynecology). The oncology department provide treatment for patients with cancer including inpatient care with the capacity of (20) beds for adults and a special department (Huda Al-Masri department) for pediatric cancer with (18) beds capacity. Huda Al-Masri department for child hood cancer was established in 2013. It served about 70 childhood cancer cases in 2014 where 80% of cases took the whole course of treatment in the same department. It has also a day care for chemotherapy treatment for patients with cancer with four beds capacity where the patients have regular visits for chemotherapy treatment scheduled sessions. The hospital has an out- patient oncology clinics five days per week with different specialists (MOH, 2016).

4.6. Study instrument

Data was collected by using self-administered questionnaire. The questionnaire consisted of four sections :

Section One: Information sheet

It included questions related to socio-demographic data of the participant (such as age, marital status, residence place, education, economic class), cancer medical history which included (cancer type, cancer treatment, and onset of cancer diagnosis) and other seven questions assessed the psychological history of the participants.

Section Tow : EORTC QLQ-C30

" European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30) was used to assess the quality of life of patients with cancer in the current study. It is a copyrighted instrument, which has been translated and validated into 81 languages and is used in more than 3,000 studies worldwide. QLQ-C30 Version 3.0 is the most recent version and should be used for all new studies consists of 28 four-point scale item and two seven-point scale item. It is composed of multi-item scale which measures quality of life of patients with cancer using five functional scales measuring (physical, role, cognitive , emotional, social functioning), three symptoms scale measuring (pain, fatigue, nausea and vomiting), six single items measuring dyspnea, insomnia, loss of appetite, constipation, diarrhea and financial impact. 28 four-point scale item each may be answered by "not", "a little", 'quite a bit", or "very much", with two seven pointed scale items measuring global health and perception of respondent QOL (EORTC, 2001).

The scoring algorithm recommended by the EORTC , was used to transform the responses to values on a scale of 0 – 100%. For the functional scales and GQOL, a higher score corresponds to better functioning and QOL. For symptom scales, a higher score corresponds to more frequent and/or more intense symptoms. A problematic group is defined as one with a GQOL or functional scale score of 33 or less, and a symptom scale score of 66 or more on the QLQ – C30 (Alawadi & Ohaeri, 2009).

Section Three: PCL-S

Post Traumatic Disorder Checklist (PCL) measured Post-traumatic stress disorder (PTSD) symptoms in the participants. Three versions of the PCL are available : PCL-C (civilian), PCL-S (specific), PCL-M (military).

PCL-S is the version used in the current study. The PCL-S is a widely used self-report measure that assesses PTSD symptoms following noncombat-related traumas regarding specific event (Weathers et al., 1991).

The PTSD Checklist specific version (PCL-S) is a 17-item scale based on the DSM-IV criteria. It is a self-administered questionnaire that assesses the full domain of DSM-IV PTSD symptoms. It inquires about the three symptom clusters of PTSD: five re-experiencing symptoms, seven numbing/avoidance symptoms, and five hyper-arousal

symptoms. using (1 : not at all, 2 : a little bit, 3 : moderately, 4 : quite a bit, and 5: extremely) (Blanchard et al., 1996).

PCL can be scored by adding up all items for a total severity score(Weathers et al., 1991). A total symptom severity score (range = 17-85) can be obtained by summing the scores from each of the 17 items and the diagnostic cutoff score is 50(Blanchard et al., 1996). Also, PTSD severity score was used were a score of (1-18) means no PTSD, (19-34) means mild, (35-52) means moderate, and (53-85) means severe PTSD (Weathers et al,1993). These methods were utilized to assess PTSD in the current study.

4.7. Reliability and validity of the instrument

Reliability refers to the stability or consistency of information that is obtained when a measurement is performed more than once. It also can be defined as the degree to which an instrument yields the same data each time it used under the same conditions and with the same subjects (Polgar, 1997).There are different types of Reliability including:

Test-retest reliability which is a measure of reliability obtained by administering the same test twice over a period of time to a group of individuals. The scores from Time 1 and Time 2 can then be correlated in order to evaluate the test for stability over time. *Inter-rater reliability* is also a measure of reliability used to assess the degree to which different judges or raters agree in their assessment decisions, and *Internal consistency reliability* which measures reliability by evaluating the degree to which different test items that probe the same construct produce similar results (Cozby, 2001).

For the purpose of the current study internal consistency reliability was used by measuring cronbach's alpha coefficient. Cronbach's alpha coefficient is one of the most common means of estimating internal consistency of items in a scale by measuring the correlation between grouped questions in a scale related to specific concept. Commonly , an alpha level of 0.7 or higher indicate acceptable reliability , and 0.8 or higher indicates good reliability , whereas alpha level higher than 0.95 very high reliability but it is not necessarily desirable (Rubin & Bobbie, 2010). Cronbach alpha in the current study was 88.6 which indicates good reliability.

Validity refers to the adequacy with which the method of measurement is able to measure the issues or phenomena under study (Abramson, 1999). Cook and Campbell (1979) defined validity as the best available approximation to the truth or falsity of given inference, proposition or conclusion. Validity is one of the main concerns with research. "Any research can be affected by different kinds of factors which, while extraneous to the concerns of the research, can invalidate the findings" (Seliger et al., 1989).

An instrument content validity is necessarily based on judgment. It is becoming increasingly common to use the panel of substantive experts to evaluate and document the content validity of the new instruments (Polit& Beck, 2004). Content validity of the questionnaires in the current study was examined by a committee of four of professionals ; three experts in mental health and public health who hold doctoral degree (PhDs) from Al-Quds University and one psychologist from Dr.Kamal mental health hospital. Only one specialist suggests some changes in the information sheet by including the word "diagnosis" in the questions that assessed cancer medical history. No other changes were requested by them.

4.8. Data collection process

After sending a formal letter to the Palestinian Ministry of Health explaining the purpose of the study, permission was granted on March, 2015.

The researcher is working as a medical doctor in the governmental primary health care centers in Bethlehem. She was not able to collect data by herself so she trained a field worker to collect data. A female field worker who had B.A degree in medical laboratory sciences and had an experience in research. She worked with patients with cancer in Beit-Jala Governmental Hospital and she volunteered to work in the Blood Bank Unit several months before the study. The training included discussing the purpose of the study, the items of the questionnaire, the inclusion and the exclusion criteria of the study and ethical considerations.

Self-reported questionnaires were distributed to the female patients with cancer who were waiting in the oncology out-patient clinic or taking chemotherapy in the day care unit. 253 patients agreed to participate in the study, and the field worker filled in 103 questionnaires because these participants did not know how to read or write while the

others were filled in by the participants themselves (150 questionnaires) . The data collection took four months from April, 2015 to end of July, 2015.

Each participant was asked for her willingness to participate in the study. Forty-five females patients with cancer refused to fill in the questionnaire after the explanation of the study purpose to them during data collection period.

Data collection was stopped after recruiting the sample size of 253 participants.

4.9. Data Analysis :

Statistical package for social science (SPSS) version 20 was used for data analysis. The data were checked for the entry errors (data clearance). Characteristics of the sample obtained through descriptive analysis (frequencies and means). The relation between socio-demographic variables, cancer type and treatment and both QOL and PTSD was done by using one-way ANOVA, t-test, Tukey HSD test and chi-square tests. Correlation was used to measure the association between symptoms and QOL and regression analysis was used to measure the association between QOL and PTSD.

4.10. Ethical considerations

Approval from Palestinian Ministry of Health was obtained after being formally approached. Information about the purpose of the study and the questionnaire were presented in a formal letter from Al-Quds University to the Palestinian Ministry of Health.

Also, School of Public Health at Al-Quds University approved to conduct this study according to the thesis preparation guide of the Faculty of Postgraduate Studies.

Participants were provided with the information sheet about the study including the aim of the study; objectives, and they were informed that they had the rights to refuse to participate in the study. Verbal consent was considered as the participant agreed to fulfill in the questionnaire.

Confidentiality and privacy were assured for all the participants and they were informed that all the information would be kept strictly confidential. In addition, data was protected

and appropriately stored; all files were stored on computer and were protected by a password and nobody was allowed to access it except the researcher and the supervisor. No names or codes or any other mechanisms were used to trace responses back to an individual participant.

4.11 Summary

This study utilized a cross sectional study design to assess the quality of life and PTSD among females patients with cancer attending Beit-Jala Governmental Hospital in Bethlehem. The data tools used were self-reported questionnaires including socio-demographic self-report questionnaire, EORTC QLQ-C30 questionnaire , PTSD Checklist – Specific (PCL-S). The validity of the questionnaires was assessed by committee of four of professionals ; one mental health specialist, two public health experts from Al-Quds University and one psychologist from "Dr.Kamal" Governmental Mental Health Hospital. A sample size of 253 participants participated in the study with convenient sampling method.

Different ethical issues including consent forms and confidentiality were discussed in this chapter. The next chapter presented the results of the current study.

Chapter Five

Results

5.1. Introduction

As mentioned in previous chapter, a cross sectional study was utilized. A sample of 253 female patients with cancer aged 18 and above in Beit-Jala Governmental hospital was obtained. Data was collected by: EROTC QLQ-C30 for quality of life and PCL-S for PTSD.

This chapter presented the findings of the current study as the following:

- Section one: Description of the characteristics of the participants and cancer medical history and psychological history.
- Section two: The results of EROTC QLQ-C30 and PCL-S scales.
- Section Three: The relationship between dependent and independent variables.

5.2. Section one: The characteristics of the participants, cancer medical history and psychological history:

From 253 female patients with cancer aged 18 and above,19.4%(n=49) were 20 to below 40 years old, 24.5% (n=62) were 40 to below 50 years old, 26.1% (n=66) were 50 to below 60 years old and 30% (n=76) were 60 years old and over. The mean age of the participant was 52.6 years with minimum age of 20 years and maximum age of 81 years old as seen in table (5.1).

For the marital status, the majority of the participants were married (77.9%, n=197), while only 6.7% (n=17) were single, 15.4% (n=39) were widows and none of them was divorced. Considering the educational level of the participants; 40.7% (n=103) were illiterate, 21.7% (n=55) had only primary education, 24.9% (n=63) had secondary education and 12.6% (n=32) had university level (see table 5.1).

64.8% (n=164) of the participants were from Hebron, while 31.6% (n=80) were from Bethlehem, 3.1% (n=8) were from Ramallah, and 0.4% (n=1) was from Jerusalem. Furthermore, 58.5% (n=148) of the participants lived in a village, 37.5% (n=95) were from a city and 4% (n=10) were from the refugee camps as shown in table (5.1). Meanwhile, regarding the economic status of the participants, 64% (n=162) had a monthly income of less than 2000 NIS and 36% (n=91) had a monthly income of more than 2000 NIS (see table 5.1).

Table (5.1) Distribution of the participants according to socio-demographic characteristics.

		Frequency	Percentage
Age* group	18 – below 40 years old	49	19.4%
	40 - below 50 years old	62	24.5%
	50 - below 60 years old	66	26.1%
	60 years and over	76	30 %
Marital status	Single	17	6.7%
	Married	197	77.9%
	Widow	39	15.4%
Educational level	Illiterate	103	40.7%
	Primary	55	21.7%
	Secondary	63	24.9%
	University	32	12.6%
Governorate	Hebron	164	64.8%
	Bethlehem	80	31.6%
	Ramallah	8	3.1%
	Jerusalem	1	0.4%
Place of residence	City	95	37.5%
	Village	148	58.5%
	Camp	10	4%
Monthly income	Less than 2000 NIS	162	64%
	2000-4000 NIS	91	36%
	More than 4000	0	0%

*Mean age=52.6 Min.= 20 Max.=81

Further, three questions related to participants' medical history were examined as seen in table (5.2). For example, the participants were asked about the type of cancer they has and their responses were categorized into two groups: breast cancer and other cancer types (such as colon, stomach, bone , endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma). The results showed that 85% (n=215) of the participants had breast cancer and 15% (n=38) had other cancer types (such as colon, stomach, bone , endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma).

Table (5.2) Distribution of the participants according to cancer types.

Cancer site	Frequency	Percentage
Breast cancer	215	85%
Other cancer types	38	15%
Total	253	100%

Also, the onset since cancer diagnosis was classified into four groups; those who were diagnosed with cancer for less than 6 months, those who were diagnosed with cancer from 6 months to less than one year, those who were diagnosed with cancer for one year to less than 2 years, and those who were ill for more than 2 years. Findings showed that 32% (n=81) of the participants reported that their duration of illness was less than 6 months, 37.2% (n=94) reported from 6 months to less than one year, 25.3% (n=64) reported from one year to less than 2 years, and 5.5% (n=14) stated more than 2 years (see table 5.3).

Table (5.3) Distribution of the participants according to the onset of cancer diagnosis.

Onset of diagnosis	Frequency	Percentage
Less than 6 months	81	32%
6 months – less than 12 months	94	37.2%
12 months – less than 24 months	64	25.3%
24 months and above	14	5.5%
Total	253	100%

Regarding cancer treatment, 73.9% (n=187) of the participants reported receiving a combined treatment of chemotherapy and surgical therapy in their treatment , while 22.1% (n=56) were treated with only chemotherapy and 4% (n=10) of the participants were

treated with other treatment modalities such as combinations of chemotherapy, surgical and radiotherapy as shown in table (5.4).

Table (5.4) The frequencies and percentages of cancer treatment in the study participants.

Cancer treatment	Frequency	Percentage
Chemotherapy	56	22.1%
Chemotherapy & surgical	187	73.9%
Other treatment modalities	10	4%

Finally, seven questions assessed the psychological history of the participants. For example, the participants were asked if they suffered from any psychological problems before or after their cancer diagnosis, what was that problem, what type of psychological treatment they had, and if the participant considered to harm herself after she had been diagnosed with cancer. There answers were negative for all the questions as none of the participants reported having any psychological problems before or after cancer diagnosis, and also none of them reported thinking about harming themselves after being diagnosed with cancer.

5.3. Section two: The results of EROTC QLQ-C30 and PCL-S.

This section consisted of two parts:

Part one: Quality of life related questions finding.

Part two: PTSD related questions findings.

5.3.1 Part one: Quality of life related questions finding.

This part presented the descriptive statistics of quality of life, the means QOL domains and the 33% cut off point of QOL domains findings.

Thirty questions were used to assess quality of life of female patients with cancer aged 18 years old and above. Frequency and percentages of the participants response are shown in table (5.5). In general, findings showed that participants' responses varied between "not at all" and "a little" for most of the questions. The first three questions were the only questions that most of the participants responses were "quite a bit " and "very much" .

For example, the physical function of the participants was assessed in the first five questions. The first three of them resulted in high percentages of responses as "quite a bit" and "very much". The participants were asked if they had any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase, 55.3% (n=140) answered "very much", and 24.9% (n=63) answered "quite a bit". The, second question assessed if participants had any trouble taking a long walk and 48.6% (n=123) answered "very much", and 28.1% (n=71) answered "quite a bit". Also, the third question assessed if the participant had any trouble taking a short walk outside of the house and 32.8% (n=83) of the participants answered "very much", and 27.3% (n=69) answered "quite a bit".

For the role function, the participants were asked if they had a limitation in doing either their work or other daily activities and if they had a limitation in pursuing their hobbies or other leisure time activities during the past week (questions six & seven respectively). 32.8% (n=83) and 33.5 (n=85) of the participants answered "not at all" to question six and seven respectively, and 35.6% (n=90) answered "a little" to question six and seven respectively.

Moreover, the cognitive function of the participants was assessed in questions number twenty and twenty five. The participants were asked if they had difficulty in concentrating on things, like reading a newspaper or watching television and 53% (n=134) answered "not at all" and when they were asked if they had difficulty in remembering things, the majority (62.8%,n=159) answered "not at all".

In addition, the emotional functioning was assessed by four questions (question number twenty one to question number twenty four). Most of their answers were not at all. For example when the participants were asked if they felt tense in the past week, 55.7% (n=141) answered "not at all", when they were asked if they were worried, 56.1% (n=142) answered "not at all", when they were asked if they felt irritable in the past week, 46.2% (n=117) answered "not at all", and when they were asked if they felt depressed in the past week, 67.2% (n=170) also answered "not at all".

Furthermore, the social function was assessed by questions number twenty six and twenty seven and 76.7% (n=194) of the participants answered “not at all” when they were asked if their physical condition or medical treatment interfered with your family life (question number twenty six) whereas 74.7% (n=189) of the participants answered “not at all” when asked if their physical condition or medical treatment interfered with their social activities (question number twenty seven).

Regarding symptoms, 50.2% (n=127) of the participants answered that did not have pain “at all” in the past week ,while 34% (n=86) answered that they need to rest “quite a bit” and 14.2% (n=36) reported that they needed rest “very much” . On the other hand,43.5% (n=110) of the participants answered “not at all” when asked if they had trouble sleeping in the past week, while 20.9% (n=53) answered “very much”.

Also, the financial impact of cancer was assessed in question number twenty eight. The participants were asked their physical condition or medical treatment caused them financial difficulties and 52.6% (n=133) answered “not at all”, 26.5% (n=67) answered a little, 13.8% (n=35) answered quite a bit and 7.1% (n=18) answered very much.

Finally, the last two questions assessed the participants rating overall health and quality of life. The rating score was between one (indicating very poor condition) and seven (indicating excellent condition). The majority of the participants rated their QOL and overall health on score 4 and above which indicated good condition in general. For example, table (5.7) showed that 32.8% (n=83) of the participants rated their overall health in the past week as 4, and 33.2% (n=84) rated their overall quality of life in the past week as 4. However, only 0.8% (n=2) rated the two questions as very poor, and 1.6% (n=4) rated them as “excellent”.

In addition, participants’ responses were checked to assess which questions of QOL questionnaires had 60% or more of the participant’s responses “quite a bit” or “very much” and the results revealed only three questions which were the first three questions (question number 1,2 and 3) that assessed the physical function of the participants. All other (23) questions had more than 60% of the responses in “not at all” and “a little” answers. For example, q12 (felt weak), 67.2% of the participants responded to it as “not at all” and “a little” they felt weak in the past week ,q13 (lacked appetite) 78.6% of the participants responded as “not at all” and “a little” they lacked appetite in the past week, q14 (felt nauseated) 86.9% of the participants responded as “not at all” and “a little” they

felt nauseated in the past week, q15. (vomited) as 94.9% of the participants responded as "not at all" and "a little" they vomited in the past week, q16.(had been constipated) as 75.9% of the participants responded as "not at all" and "a little" of being constipated in the past week, q17(had diarrhea?) as 94.8% of the participants responded as "not at all" and "a little" had diarrhea in the past week, q18. (were tired) as 75.5% of the participants responded "not at all" and "a little" being tired in the past week as seen in table (5.5).

Table (5.5) The participants' answers to the questions related to their quality of life (EROTC QLQ-C30).

Question	Percentage			
	Not at All	**A Little**	**Quite a Bit**	**Very Much**
1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?	7.9%	11.9%	24.9%	55.3%
2. Do you have any trouble taking a long walk?	12.3%	11.1%	28.1%	48.6%
3. Do you have any trouble taking a short walk outside of the house?	23.3%	16.6%	27.3%	32.8%
4. Do you need to stay in bed or a chair during the day?	21.7%	39.9%	29.2%	9.1%
5. Do you need help with eating, dressing, washing yourself or using the toilet?	77.1%	12.3%	7.9%	2.8%
During the past week:				
6. Were you limited in doing either your work or other daily activities?	32.8%	35.6%	22.5%	9.1%
7. Were you limited in pursuing your hobbies or other leisure time activities?	33.5%	35.6%	21.7%	9.1%
8. Were you short of breath?	53%	30.4%	7.9%	8.7%
9. Have you had pain?	50.2%	34.8%	11.1%	4%
10. Did you need to rest?	10.7%	41.1%	34%	14.2%
11. Have you had trouble sleeping?	43.5%	21.7%	13.8%	20.9%
12. Have you felt weak?	47.8%	30.8%	17.8%	3.6%
13. Have you lacked appetite	41.5%	25.7%	17.8%	15%
14. Have you felt nauseated?	56.1%	30.8%	8.3%	4.7%
15. Have you vomited?	77.9%	17%	3.6%	1.6%
16. Have you been constipated	55.3%	20.6%	11.9%	12.3%
17. Have you had diarrhea?	73.1%	21.7%	4%	1.2%
18. Were you tired?	30%	45.5%	17.4%	7.1%
19. Did pain interfere with your daily activities?	39.5%	31.2%	24.5%	4.7%
20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?	53%	20.9%	18.2%	7.9%

Continued

Table (5.5) continued

21. Did you feel tense?	55.7%	27.3%	11.5%	5.5%
22. Did you worry?	56.1%	27.7%	10.7%	5.5%
23. Did you feel irritable?	46.2%	33.2%	11.1%	9.5%
24. Did you feel depressed	67.2%	21.7%	5.1%	5.9%
25. Have you had difficulty remembering things?	62.8%	26.5%	5.5%	5.1%
26. Has your physical condition or medical treatment interfered with your family life?	76.7%	14.2%	5.9%	3.2%
27. Has your physical condition or medical treatment interfered with your social activities?	74.7%	15.4%	6.7%	3.2%
28. Has your physical condition or medical treatment caused you financial difficulties?	52.6%	26.5%	13.8%	7.1%

	Percentage						
	1 **Very poor**	2	3	4	5	6	7 **Excellent**
29. How would you rate your overall health during the past week?	0.8%	3.6%	14.6%	32.8%	29.6%	17%	1.6%
30. How would you rate your overall quality of life during the past week?	0.8%	3.6%	14.2%	33.2%	29.6%	17%	1.6%

Means of EORTC QOL domains

As mentioned in chapter three, the scoring algorithm recommended by the EORTC was used to transform the responses to values on a scale of 0 – 100% using a formula for every domain available in EORTC manual. The principle for scoring is to estimate the average of the items that contribute to the scale and use a linear transformation to standardize the score, so that scores range from 0 to 100. For the functional scales and GQOL, a higher score corresponds to better functioning and QOL. For symptom scales, a higher score corresponds to more frequent and/or more intense symptoms. The results showed that the mean for GQOL for the participants was 57.4 (SD=18.9) indicating average global quality of life and the mean of physical functioning (PF) was 48.5 (SD=26.30) indicating lower than average physical functioning. On the other hand, the mean for role functioning was 64.3 (SD=31.7), the mean for emotional functioning was 77.8 (SD=27), the mean for cognitive functioning was 77 (SD=25.7) and the mean of social functioning was 87.7 (SD=24.6) indicating higher than average social functioning than all other domains as seen in table (5.6).

Table (5.6) Means and standard deviations for GQOL and Functions domains in QOL questionnaire :

	N	Mean*	Std. Deviation
Global quality of life (GQOL)	253	57.4	18.9
Physical functioning (PF)	253	48.5	26.3
Role functioning (RF)	253	64.3	31.7
Emotional functioning (EF)	253	77.8	27
Cognitive functioning (CF)	253	77	25.7
Social functioning (SF)	253	87.7	24.6

*Higher means indicates better GQOL and functioning

As mentioned previously, a higher score in symptomatic scale represents a high level of symptomatology/problem and indicated that insomnia, fatigue and loss of appetite were the most troublesome symptoms the participants complained of. Pain, constipation and dyspnea came next in participants symptoms responses and nausea and vomiting were the least in QOL questionnaire as seen in table (5.7). For example, for fatigue, the mean was 36.7 (SD=26.3), for nausea and vomiting (NV) it was 15.1 (SD=22.5) and for pain (PA) it was 27.2 (SD=26). Moreover, the results showed that dyspnea (DY) had a mean of 24.1 (SD=31.3), and insomnia had a mean of 37.4 (SD=39.5). For loss of appetite (AP), the mean was 35.4 (SD=36.4), for constipation it was 27 (SD=35.4) and for diarrhea the mean was 11.5 with (SD=23).

Also , the mean of financial impact of cancer on QOL of the participants was (25.2) with a standard deviation of (31.5) as seen in table (5.7).

Table (5.7) Means and standard deviations for responses of participants to the symptoms scales and the single items affecting QOL of the participants

	N	Mean*	Std. Deviation
Fatigue (FA)	253	36.7	26.3
Nausea and Vomiting(NV)	253	15.1	22.5
Pain (PA)	253	27.2	26
Dyspnea (DY)	253	24.1	31.3
Insomnia (SL)	253	37.4	39.5
Loss of appetite (AP)	253	35.4	36.4
Constipation (CO)	253	27	35.4
Diarrhea (DI)	253	11.5	23
Financial Difficulties (FI)	253	25.2	31.5

*Higher mean represent higher symptom severity and worse financial difficulties.

Furthermore, 33% cut-off scale score was used to categorize the participants responses, because this score was suggested from different studies for better understanding of QOL means generated from EROTC questionnaire (Alawadi & Ohaeri, 2009; Fayers, 2001; Khleif & Imam, 2013). For the functional scales and the GQOL, we defined subjects with problematic functioning as those who scored <33%, while subjects in good condition scored >66%. For symptom scales, subjects scoring <33% were judged as having less severe symptoms, while those scoring > 66% had more intense symptoms (Alawadi& Ohaeri, 2009).

The 33% cut off point classification for the physical function showed that 29.64% of the participants had severe problem in physical functioning corresponding to mean of (<33%), 39.5% were moderately affected by cancer physically (33% to 66%) and 30.83% were having a good physical functioning as shown figure (5.1).

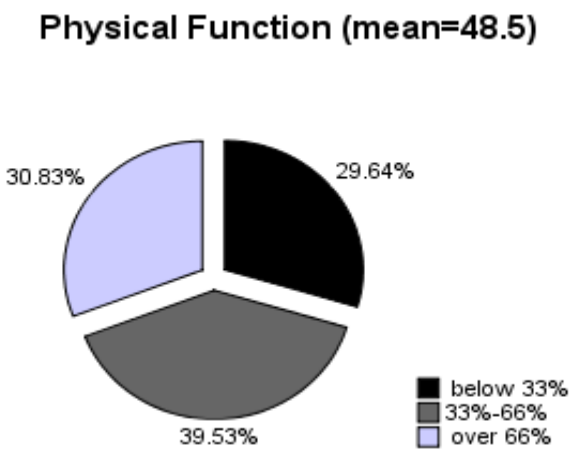


Figure (5.1) 33% cut of point of physical domain scores.

Regarding the role functioning, About 67.9% had a good role functioning based on the 33% cut off point classification (>66%) and 22.9% had moderate effect of cancer on their role functioning (33% to 66%), while only 9.09% had severe problem in life roles after cancer diagnosis (see figure 5.2).

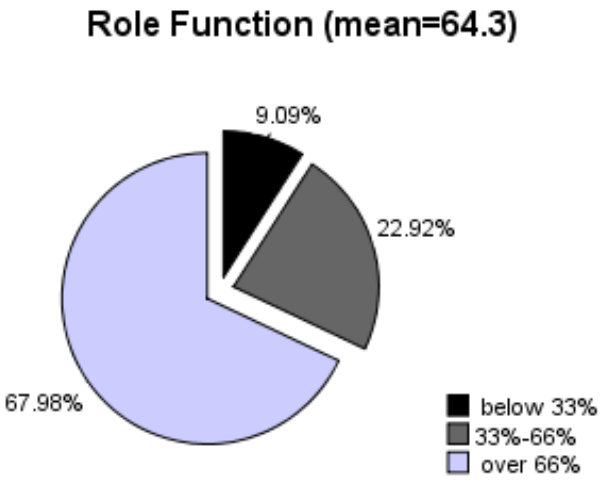


Figure (5.2) 33% cut of point of role domain scores.

In the meanwhile, 80.63% of the participants had a good emotional functioning (>66%) and only 6.7% had severe effect for cancer on their emotional functioning (<33%)(see figure 5.3).

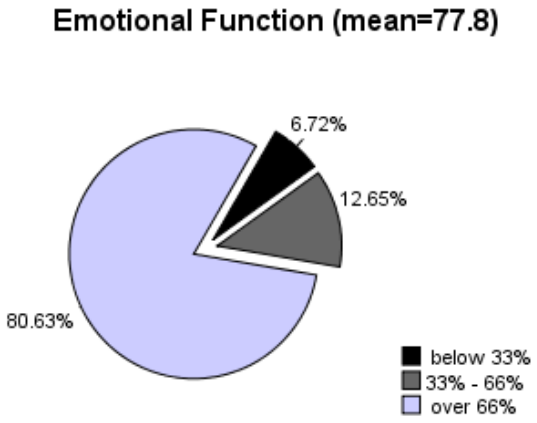


Figure (5.3) 33% cut of point of emotional domain scores.

Also, 73.9% of the study participants had a good cognitive functioning (>66%) and about 21.7% had moderate effect of cancer on their cognitive functioning (33% to 66%) while only 4.35% had severe effect of cancer on their cognitive functioning (see figure 5.4).

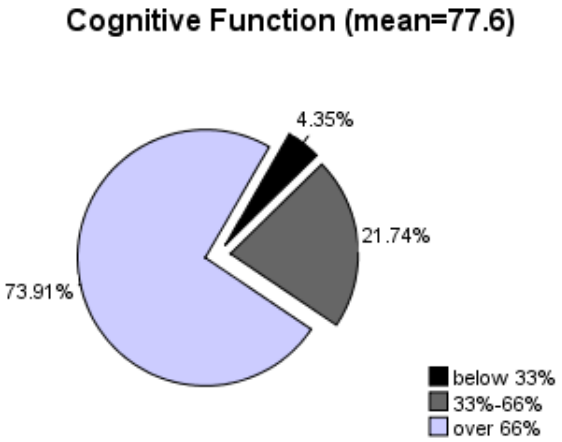


Figure (5.4) 33% cut of point of cognitive domain means

Regarding the social functioning, the majority of the study participants (90.1%) had good social functioning on 33% cut off point classification (>66%) and 6.7% had moderate social functioning, while the minority (3.1%) had below the 33% cut off value representing severe social functioning problem (see figure 5.5).

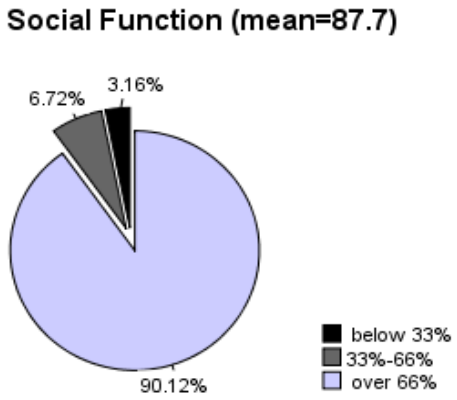


Figure (5.5) 33% cut of point of social domain scores.

Furthermore, 5.1% of the participants reported having severe effect of cancer on their global quality of life corresponding to (<33%) score and 47.4% had moderate effect of cancer on their global QOL (33% to 66%) while 47.4% reported having mild effect of cancer on their overall quality of life (see figure 5.6).

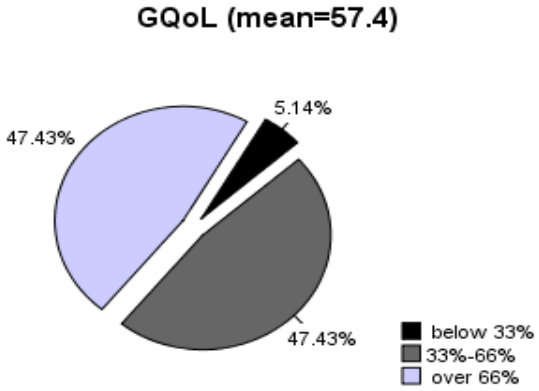


Figure (5.6) 33% cut of point of GQOL domain scores.

For the symptoms scale of QOL, the 33% cut off point classification results of pain showed that 11.46% of the participants had severe pain corresponding to (>66%) cut off point and 35.18% had moderate level of pain corresponding to (33% to 66%), while 53.36% reported no pain in the past week as shown in figure (5.7).

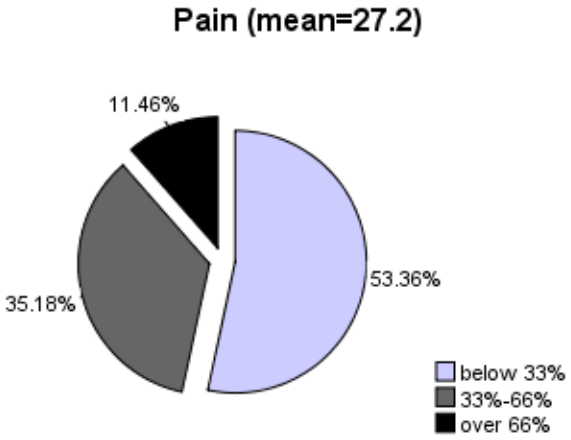


Figure (5.7) 33% cut of point of pain.

Only 5.14% of the participants reported having severe nausea and vomiting (>66%) and about 18.97% had moderate level of nausea and vomiting (33% to 66%) while 75.89% reported no nausea and vomiting in the past week (see figure 5.8).

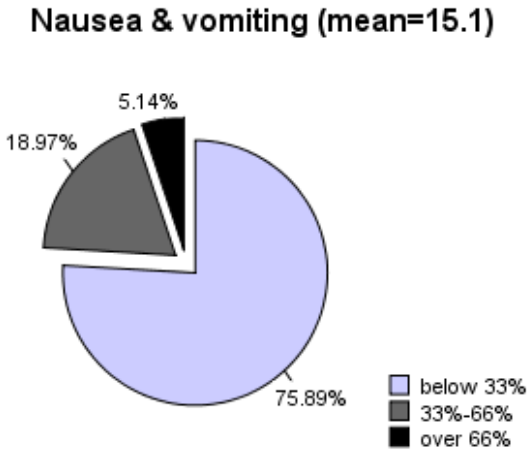


Figure (5.8) 33% cut of point of nausea & vomiting.

Also, 20.5% of the participants reported having severe fatigue corresponding to (>66%) score and 35.1% had moderate level of fatigue corresponding to (33% to 66%) score and 20.55% reported having severe fatigue (<33%) based on the 33% cut off point classification (see figure 5.9).

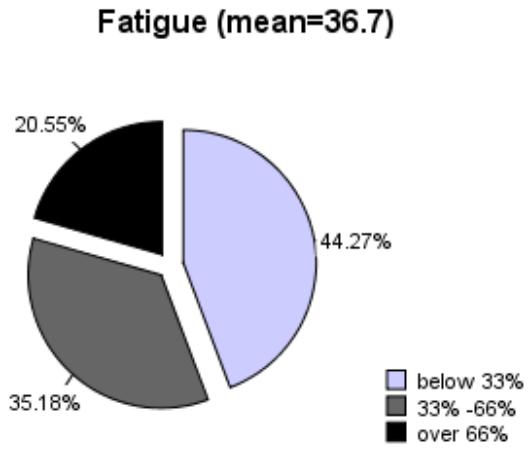


Figure (5.9) 33% cut of point off classifications for fatigue.

In addition, 34.7% of the participants reported having severe insomnia corresponding to (>66%) score while 43.87% reported no insomnia in the past week as shown in figure (5.10).

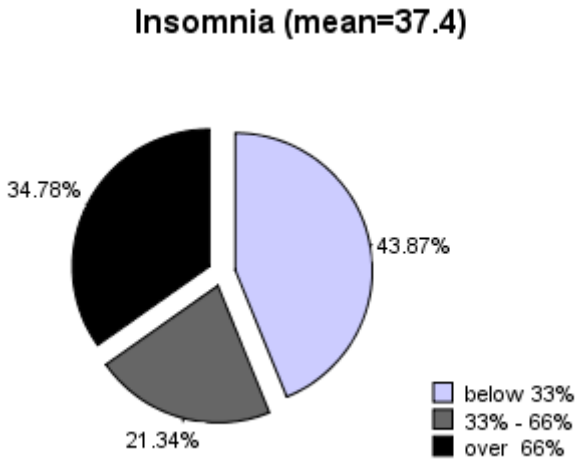


Figure (5.10) 33% cut of point off classifications for insomnia.

Moreover, 16.6% of the participants reported having severe dyspnea corresponding to (>66%) score while 53.36% reported no dyspnea in the past week respectively (see figure 5.11).

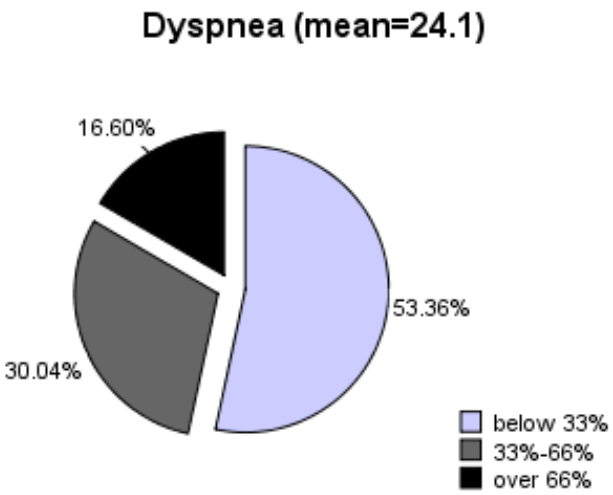


Figure (5.11) 33% cut of point off classifications for dyspnea.

Furthermore, only 5.1% of the participants reported having severe diarrhea and 73.9% reported having mild diarrhea in the past week (see figure 5.12).

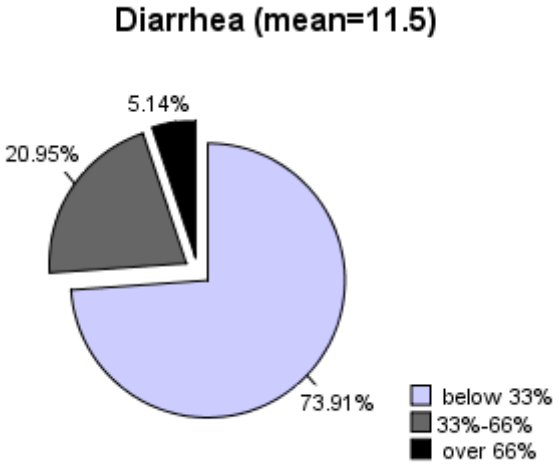


Figure (5.12) 33% cut of point off classifications for diarrhea.

On the other hand, 24.1% of the participants reported having severe constipation corresponding to (>66%) score and about 54.9% reported mild constipation in the past week as shown in figure (5.13).

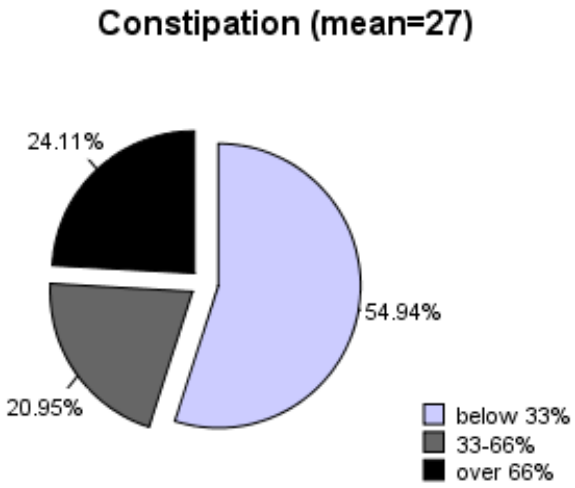


Figure (5.13) 33% cut of point off classifications for constipation.

For loss of appetite, 32.8% of the participants reported having severe loss of appetite corresponding to (>66%) score while 41.1% of the participants reported having mild effect of cancer on their appetite (see figure 5.14).

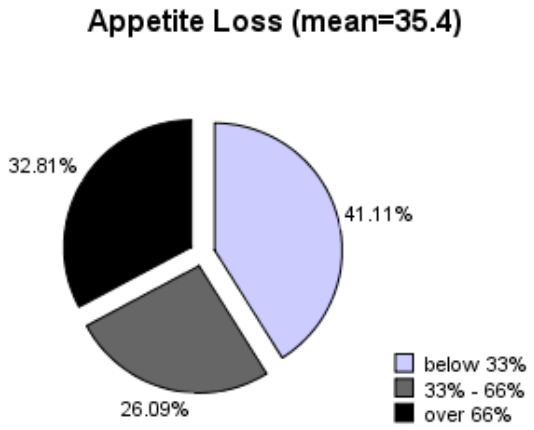


Figure (5.14) 33% cut of point off classifications for appetite loss.

Finally, the results for 33% score cut off point for financial difficulties showed that 20.5% of the participants had severe financial difficulty after cancer diagnosis corresponding to (>66%) score, where about 26.5% have moderate financial difficulties after cancer diagnosis (33% to 66%) and 53% of the participants reported mild financial difficulties after cancer diagnosis corresponding to <33% score as shown in figure (5.15).

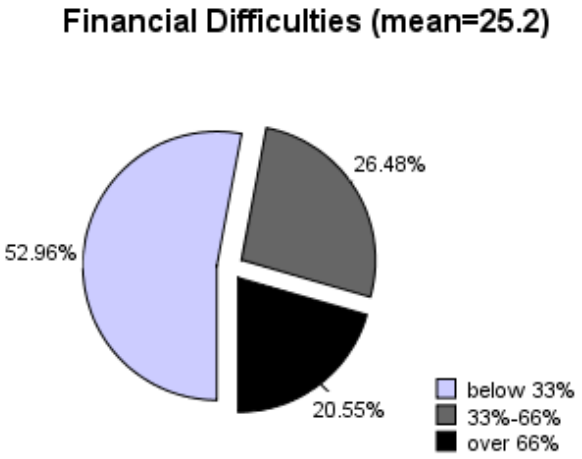


Figure (5.15) 33% cut of point off classifications for financial difficulties.

5.3.2 Part two: Post traumatic stress disorder checklist (PCL-S)

PTSD was assessed by using post-traumatic stress disorder checklist –specific version (PCL-S) which includes 17 items. The scores of PTSD were classified into 4 categories: No PTSD, mild, moderate, and severe according to total symptoms severity score(Weathers et al., 1991). Frequency and percentage were used to assess the levels of PTSD among the participants. Clinically significant symptoms of PTSD is considered when PCL-S score is 50 and above (Blanchard et al., 1996). The results showed that the prevalence of PTSD symptoms among the participants based on using 50 cut- off was 3% (n=8) (see table 5.8).

Table (5.8) Prevalence of clinical PTSD symptoms using 50 cut off point.

PTSD	Frequency	Percentage
No PTSD diagnostic symptoms	248	97%
PTSD diagnostic symptoms	8	3%
Total	253	100%

Also, based on the PTSD severity score according to Weathers et al. (1991). The results showed that 2% (n=5) of the participants had severe PTSD score, 23.3% (n=59) had moderate score and 68.8% (n=174) had mild score. PTSD was absent only in 5.9% (n=15) of the study participants (see table 5.10)

Table (5.9) Severity of PTSD symptoms

Severity	PCL-S score	Frequency	Percentage
No PTSD	(17-18)	15	5.9%
Mild	(19-34)	174	68.8%
Moderate	(35-52)	59	23.3%
Severe	(53-85)	5	2%
Total		253	100%

5.4 Section Three: The relationship between dependent and independent variables.

This section consists of three parts :

Part one: the relationship between QOL and independent variables.

Part two: the relationship between PTSD and independent variables.

Part three: the relationship between QOL and PTSD

5.4.1 Part one: the relationship between QOL and independent variables.

This section represented the relationship between the quality of life, and independent variables including: socio-demographic data, cancer medical history by using one-way ANOVA, t-tests and tukeys' test. Tukeys' test was used when a significant difference in three or more means were obtained by ANOVA test for additional exploration of the differences among means.

Table (5.10) showed the relationship between the major components of QOL questionnaire such as PF, RF and SF functioning and the independent variables including age, , place of residency, educational level, economic status, marital status ,number of family members caregiver, type of cancer, cancer treatment and duration since diagnosis). The relationship between PF, RF and SF functioning and age groups showed that there were significant differences between age and PF at a p value of ($p<0.001$), RF at a p value of ($p=0.01$) and SF with a p value of ($p=0.03$) . The mean difference in PF were between groups (20 - <40 years old) with the mean of 61.36, (40 -<50 years) age group with a mean of 56.77, (50 - <60 years) age group with a mean of 43.74 and (>=60 years) age group with a mean of 37.63.Tukey comparison test showed that the difference were in the favor of younger age groups as seen in table (1) in appendix (VI), which indicated that younger patients with cancer had better physical function. In relation to role function, the difference were between the age group (40 - <50 years) with a mean of 74.19 and (>=60 years) age group with a mean of 55.04. Tukey Comparison tests showed that the difference was also in the favor of the younger age group as seen in

table (1) in appendix (VI), which indicated that the younger the patient with cancer, the better role functioning they had. However, Tukey Comparison tests showed that the mean difference regarding social functioning was in the favor of the older age group as seen in table (1) in appendix (VI), which indicated that the older the patient with cancer is the better social function they had.

Regarding the relationship between educational level and PF, RF and SF functions, one way ANOVA test showed that there were significant differences at ($p<0.001$) level between the means of PF components attributed to the educational level of the participants. The mean difference was between illiterate group (mean= 40.78), secondary education group with a (mean=53.02) and university educational level group with a (mean=63.13) as seen in table (5.10). Tukey Comparison test showed that university education group had better PF than secondary and illiterate groups which indicated that the higher the educational level of the female patient with cancer, the better her physical function (see table (3) in appendix VI)

In addition, t-test was used to assess the relationship between economic status and PF, RF and SF as shown in table (5.10).There was a significant difference between the means of PF ($p<0.001$) and SF ($p<0.01$) components attributed to economic status of the participants. For PF, the difference was in favor of the group that have income between (2000-4000 NIS) with a mean of 57 corresponding to the group (<2000 NIS) with a mean of 43.74. This indicated that the higher the economic status of the participant, the better physical function they had. For SF, the differences were in favor of the group (<2000 NIS) with a mean of 90.84 than the group (2000-4000 NIS) with a mean of 82.05, indicating that the lower the economic level of patients with cancer the better social function they had (see table 5.10).

Moreover, table (5.10) indicated that there were significant differences between marital status in relation to PF with a p value ($p<0.02$) and RF with a p value ($p<0.01$) by using one way ANOVA test. The differences were between single group (mean=52.16), married (mean=52.16) and widows (mean=37.78). Tukey comparison tests results showed that differences were between married and widows

in favor of married group at a p value (p=0.017) as seen in table (2) in appendix (VI). This means that married female patients with cancer had better physical function than widows female patients with cancer. Regarding RF, the differences were between married (mean=67.6) than singles (mean=48.04) and Widows (mean=54.7). Tukey Comparison tests showed that the differences were the in favor of married than widows and single groups. This indicated that married female patients with cancer had better role function than widows and single female patients with cancer (see table (2) in appendix VI).

Further, t-test was used to assess the relationship between PF, RF and SF components attributed to cancer type, and the results showed that there were significant difference between the means of PF at a p-value of ($p<0.001$), RF at a p-value of ($p<0.001$) and SF at a p-value ($p=0.01$) attributed to cancer type. For PF, the differences were in favor of breast cancer corresponding to the other type of cancer. Also, the differences were in favor of the breast cancer corresponding to the other type of cancer in relation to RF and SF as seen in table (5.10). The results indicated that patients with breast cancer had better physical function, role functioning, and social functioning than other types of cancer (such as colon, stomach, bone , endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma).

Finally, the results of ANOVA test showed that there were significant differences between the mean of RF components attributed to cancer treatment at p value ($p=0.05$). The differences were between chemotherapy & surgery group (mean=48.95), chemotherapy group (mean=49.4) and other treatment modalities group (mean=35.33) as seen in table (5.10). Tukey Comparison tests showed that the significant differences was between chemotherapy & surgery group and other treatment modalities group at ($p=0.036$) in favor of chemotherapy & surgery group as seen in table (5) in appendix (VI). This indicated that female patient with cancer who underwent chemotherapy and surgery as a treatment for their cancer had better role function than female patient who took other treatment modalities (such as combinations of chemotherapy, surgical and radiotherapy).

Table (5.10): Relationships between the quality of life domains (physical, role, social functions) and socio-demographic &cancer medical history (ANOVA & t-test)

Variables		Physical Function			Role Function			Social Function		
		Mean	F/T	P-value	Mean	F/T	P-value	Mean	F/T	P-value
Age	20 - <40 years	61.36	12.5*	0.001	64.63	4.37*	0.01	79.25	2.93*	0.03
	40- <50 years	56.77			74.19			86.56		
	50 - <60 years	43.74			65.40			90.91		
	>=60	37.63			55.04			91.23		
Place of Residence	City	49.89	0.93	0.39	63.86	0.12	0.88	87.37	0.69	0.50
	Village	48.33			64.86			87.27		
	Camp	38.00			60.00			96.67		
Education Level	Illiterate	40.78	7.44*	0.001	60.36	1.09	0.35	91.59	2.21	0.09
	Primary	49.33			65.45			88.79		
	Secondary	53.02			69.31			83.33		
	University education	63.13			65.10			81.77		
Economic status	<2000 NIS	43.74	-3.9*	0.001	62.86	-0.96	0.34	90.84	2.77*	0.01
	2000-4000 NIS	57.00			66.85			82.05		
Marital Status	Single	52.16	3.97*	0.02	48.04	5.27*	0.01	77.45	1.62	0.20
	Married	50.32			67.60			88.24		
	Widow	37.78			54.70			89.32		
Type of cancer	Breast Cancer	50.67	-3.16 *	0.001	66.67	-2.87 *	0.00	89.38	-2.64 *	0.01
	Other types	36.32			50.88			78.07		
Cancer Treatment	Chemotherapy	49.40	1.32	0.27	65.18	3.11*	0.05	88.39	1.78	0.17
	Chemotherapy and surgery	48.95			65.33			88.24		
	other treatment modalities	35.33			40.00			73.33		
Onset of Diagnosis	< 6 months	50.04	0.83	0.48	66.67	0.35	0.79	87.65	1.14	0.34
	6- <12 months	49.65			64.54			88.30		
	12 - <24 months	46.98			61.46			89.32		
	>= 24 months	39.05			61.90			76.19		

***Significant at <0.05 level.**

In addition one-way ANOVA, Tukey test and T-test were used to assess the relationship between independent variables and QOL domains including emotional function, cognitive function and global quality of life as seen in table (5.11). ANOVA test showed that there were significant differences between the means of CF at a p-value ($p<0.001$) and global QOL at a p-value ($p<0.001$) attributed to the age of the participants. The differences in CF were between the age groups (20 - <40 years old) with a mean of (mean =90.48), (40- <50 years) age group with a

mean of (mean =85.75), (50 - <60 years) age group with a mean of (mean=77.27) and (>=60 years) age group with a (mean=63.16). Tukey Comparison tests showed that the differences were in favor of younger age groups as shown in table (1) in appendix VI. This indicated that the young female patients with cancer had better cognitive function. In relation to global quality of life (GQoL), the difference were between the age groups (20 - <40 years old) with a mean of (mean =56.29), (40- <50 years) age group (mean =63.55), (50 - <60 years) age group (mean=59.22) and (>=60 years old) age group (mean=51.64). Tukey Comparison tests a significant difference at a p value (p=0.001) between (>=60 years old) age group and (40- <50 years) age group in favor of the later (see table (1) in appendix VI), which indicated that the older age group had less Global Quality of Life than younger age group.

Moreover, ANOVA test results showed that there were significant differences between the means of EF at a p-value (p=0.04) and CF at a p-value (p<0.001) attributed to educational level of the participants. For EF, the difference was between illiterate group (mean=83.5), primary education group (mean=75.15), secondary education (mean=72.22) group, and university education group (mean=75.26) as seen in table (5.11). Tukey Comparison tests showed that the significant difference was between illiterate and secondary education groups at a p value (p=0.044). The difference was in favor of illiterate participants which indicated that the less education level that female patients with cancer had, the better emotional function they had. In relation to CF, the differences were between illiterate group (mean=71.04), primary education group (mean=81.21), secondary education group (mean=76.72) and university education group (mean=94.79) as seen in table (5.11). Tukey Comparison tests showed that the difference was in favor of the participants with university education at a p value (p<0.001), which indicated that female patients with cancer with university educational level had better cognitive function than other levels of education (see table (3) in appendix VI).

Furthermore, t-test was used to assess the relationship between CF, EF, GQOL and economic status and the results indicated significant differences between the means of CF at a p-value of ($p<0.001$) and Global QOL at a p-value of ($p=0.01$) attributed to economic status of the participants. In both domains, the differences were in favor of the group that had income between (2000-4000 NIS) with means of (CF mean=85.71, GQOL mean=61.36) corresponding to the group(<2000 NIS) with means of (CF mean=73.15, GQOL mean=55.2). This indicated that the higher the economic status of the participant, the better cognitive function and global quality of life they had (see table 5.11).

Also, in table (5.11) ANOVA test showed that there were significant difference at p-value ($p<0.001$) between the means of CF components attributed to marital status of the participants. The differences were between the single group (mean=96.08), the married group (mean=79.19) and the widow group (mean=61.97). Tukey Comparison tests showed that the differences were in favor of single group, while between the married and the widow groups in favor of the married. This means that single female patients with cancer had better cognitive function than both married and widows and married female patient with cancer had better cognitive function than widows (see table (2) in appendix VI).

Finally, there was a significant difference at a p-value of ($p=0.03$) between the means of CF attributed to onset of cancer diagnosis by using ANOVA test. The differences were between the group <6 months (mean=77.98), 6 months to <12 months of cancer diagnosis (mean=82.8), 12 months to <24 months of cancer diagnosis (mean=71.61) and (>= 24 month) of cancer diagnosis as seen in table (5.11). Tukey Comparison tests showed that the significant difference was between 6 months to <12 months of cancer diagnosis group and 12 months to <24 months of cancer diagnosis at a p value of ($p=0.035$) in favor of the former group as shown in table (6) in appendix (VI), which indicated that the shorter the onset of cancer diagnosis, the better cognitive function of female patients with cancer. However there were no significant differences between the means of EF and GQOL means and the duration of cancer diagnosis as seen in table (5.11).

Table (5.11): Relationships between the quality of life domains (emotional , cognitive functions and global quality of life) and socio-demographic & cancer medical history (ANOVA & t-test)

Variables		Emotional Functioning			Cognitive Functioning			Global Quality of Life		
		Mean	F/T	P-value	Mean	F/T	P-value	Mean	F/T	P-value
Age	20 - <40 years	68.54	2.62	0.51	90.48	16.8*	0.001	56.29	4.96*	0.001
	40- <50 years	78.36			85.75			63.44		
	50 - <60 years	79.80			77.27			59.22		
	>=60	81.69			63.16			51.64		
Place of Residence	City	76.93	0.49	0.61	80.70	1.75	0.18	59.65	1.18	0.31
	Village	77.87			76.46			56.25		
	Camp	85.83			66.67			53.33		
Education Level	Illiterate	83.50	2.74*	0.04	71.04	8.02*	0.001	55.10	2.09	0.10
	Primary	75.15			81.21			58.64		
	Secondary	72.22			76.72			56.61		
	University education	75.26			94.79			64.32		
Economic status	<2000 NIS	76.90	-7.3	0.47	73.15	-3.8*	0.001	55.2	-2.5*	0.01
	2000-4000 NIS	79.49			85.71			61.36		
Marital Status	Single	75.49	1.57	0.21	96.08	13.2*	0.001	55.39	1.75	0.18
	Married	76.65			79.19			58.54		
	Widow	84.83			61.97			52.56		
Type of cancer	Breast Cancer	78.29	-0.65	0.52	78.22	-0.81	0.42	58.26	-1.7	0.09
	Other types	75.22			74.56			52.63		
Cancer Treatment	Chemotherapy	80.95	0.53	0.59	81.55	1.61	0.20	59.23	1.90	0.15
	Chemotherapy and surgery	77.09			77.09			57.44		
	other treatment modalities	74.17			66.67			46.67		
Onset of Diagnosis	< 6 months	82.30	1.46	0.23	77.98	3.04*	0.03	60.60	1.56	0.20
	6- <12 months	75.00			82.80			57.00		
	12 - <24 months	77.99			71.61			55.34		
	>= 24 months	70.24			69.05			51.19		

***Significant at 0.05 level**

For symptomatic domains and financial impact of cancer, table (5.12) showed the relationships between pain, fatigue and financial impact QOL domains and independent variables including age, place of residency, educational level, economic status, marital status, type of cancer, cancer treatment and onset since diagnosis**.**

Regarding age, ANOVA test results indicated that there were significant differences between the means of PA at a p-value of (p=0.047) and FA at a p-value of (p=0.01) attributed to the age of the participant. The differences for PA were between the age group (20 - <40 years old) with a mean of (26.87), (40- <50 years) age group (mean =20.43) and (50 - <60 years) age group (mean=27.27) and (>=60 years old) age group (mean=32.98). The mean differences for FA were between the age group (20 - <40 years old) (mean =34.1),(40- <50 years) age group (mean =29.57), (50 - <60 years old) age group (mean=36.87) and (>=60 years old) age group (mean=44.15) as seen in table (5.12). Tukey Comparison tests showed that the differences in both PA and FA were between (40- <50 years) and (>=60 years of old) in favor of the later. This indicated that older female patients with cancer had more pain and fatigue (see table (1) in appendix VI).

In relation to place of residency, ANOVA test results showed that there were significant differences at a p-value (p<0.001) between the means of FI attributed to the place of residence. The differences were between those who lived in villages (mean=31.98), camps (mean=46.67) and city (mean=12.28) as seen table (5.12). Tukey Comparison tests showed that the significant differences were between those who lived in camp than those who lived in city at a p value of (p=0.02) in favor of the camp group, and between those who lived in village than those who lived in city at a p value of (p<0.0001) in favor for those who lived in village as seen in table (4) in appendix (VI). This indicated that female patients with cancer who were living in a camp or a village had higher financial impact of cancer than those who were living in a city.

Additionally, there were significant difference at a p-value (p=0.01) between the means of FI attributed to education Level by using ANOVA test. The results showed that the differences were between illiterate group (mean=30.74), primary education group (mean=23.64), secondary education group (mean=24.87) and university education group (mean=10.42) as seen in table (5.12). Tukey comparison test showed that the differences were between the university education group and illiterate group at a p value (p=0.007) in favor of the later group as seen in table (3)

in appendix (VI), which indicated that illiterate participants had more financial impact of cancer.

Moreover, t-test results showed that there were significant difference at p-value ($p<0.001$) between the means of FI attributed to economic status of the participants. The differences were in favor of the group that have income (<2000 NIS) (mean=33.74) in relation to those who had their income between (2000-4000 NIS) (mean=9.89) as seen in table (5.12). This indicated that the lower the economic status of the participants the more financial impact of cancer they had.

Furthermore, the results of ANOVA test indicated that there were significant difference at p-value ($p<0.001$) between the means of FI attributed to marital status of the participants. The differences were between single group (mean=9.8), married group (mean=23.69) and widow group (mean=39.32) in favor of widows group which indicated that widows participants had more financial impact of cancer than married and single participants as seen in table (5.12).

In addition, the results of t-test showed that there were significant differences between the means of PA at p-value ($p<0.001$) and FA at p-value ($p<0.001$) and cancer type of the participants. The differences were in favor of the other type of cancer (PA mean=41.67 and FA mean=52.63) in comparison with breast cancer (PA mean=24.65 and FA mean=33.90). This indicated that the participants with other types of cancer such as (colon, stomach, bone, endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma) had more pain and fatigue than the participants with breast cancer (see table 5.12).

Finally, ANOVA results test showed that there were significant difference between the means of PA at p-value ($p<0.001$) and FA at p-value ($p=0.02$) attributed to cancer treatment modality. The differences were between chemotherapy group with (PA mean=29.46 and FA mean=39.29), chemotherapy & surgery group with (PA mean=25.13 and FA mean=34.83) and other treatment modalities group with (PA mean=53.33 and FA mean=57.78) as seen in table (5.12). Tukey Comparison tests showed that the differences were in favor of the latter group which indicated that

female patients with cancer who undergo other treatment modalities (such as combinations of chemotherapy, surgical and radiotherapy) had more pain and fatigue than those who had (chemotherapy and surgery only) or (chemotherapy only)(see table (5) in appendix VI).

Table (5.12): Relationships between pain, fatigue and financial impact and socio-demographic & cancer medical history (ANOVA & t-test)

Variables		Pain			Fatigue			Financial Impact		
		Mean	F/T	P-value	Mean	F/T	P-value	Mean	F/T	P-value
Age	20 - <40 years	26.87	2.68	0.04	34.01	3.86*	0.01	19.05	2.29	0.08
	40- <50 years	20.43			29.57			21.51		
	50 - <60 years	27.27			36.87			24.75		
	>=60	32.89			44.15			32.46		
Place of Residence	City	25.09	1.04	0.36	34.27	0.96	0.38	12.28	15.3 *	0.31
	Village	27.93			37.76			31.98		
	Camp	36.67			44.44			46.67		
Education Level	Illiterate	28.16	0.90	0.44	39.48	1.73	0.16	30.74	3.57*	0.01
	Primary	29.09			34.14			23.64		
	Secondary	27.51			38.62			24.87		
	university education	20.31			28.47			10.42		
Economic status	<2000 NIS	29.42	1.82	0.07	38.82	1.71	0.09	33.74	6.20*	0.00
	2000-4000 NIS	23.26			32.97			9.89		
Marital Status	Single	27.45	0.26	0.77	37.25	1.37	0.26	9.80	6.45*	0.00
	Married	26.65			35.42			23.69		
	Widow	29.91			43.02			39.32		
Type of cancer	Breast Cancer	24.65	3.8*	0.00	33.9	4.18*	0.00	24.19	1.18	0.24
	Other types	41.67			52.63			30.7		
Cancer Treatment	Chemotherapy	29.46	6.12*	0.00	39.29	4.06*	0.02	22.02	1.22	0.30
	Chemotherapy and surgery	25.13			34.82			26.74		
	other treatment modalities	53.33			57.78			13.33		
Onset of Diagnosis	< 6 months	26.34	1.36	0.26	37.86	1.89	0.13	20.99	1.04	0.38
	6- <12 months	24.65			33.10			25.53		
	12 - <24 months	29.69			37.67			30.21		
	>= 24 months	38.10			50.00			23.81		

***Significant at 0.05 level.**

By considering the symptoms in EROTC questionnaire as independent variables and related them to GQOL as dependent variable, Pearson's test was used to test the correlation between GQOL and pain (PA),nausea & vomiting (N&V), fatigue (FA),insomnia (SL), dyspnea (DY) , diarrhea (DI), constipation (CO), appetite loss (AP) and financial impact (FI). The results showed a significant negative correlation between pain, fatigue, appetite loss and financial impact on global quality of life. In other words; the increase in pain, fatigue and appetite loss and the financial difficulties had inverse association on GQOL. The strongest relationship was between GQOL and fatigue where (Pearson Correlation=-0.35), followed by pain (Pearson Correlation= -0.255) and loss of appetite (Pearson Correlation= -0.205). The weakest relationship was with financial impact (Pearson Correlation= -0.141) as shown in table (5.13).

Table (5.13) Relationships between GQOL and symptoms and financial difficulties (Pearson's correlation)

	Pain	N&V	FA	SL	DY	DI	CO	AP	FI
R	-0.255	0.017	-0.35	-0.029	0.033	0.059	0.067	-0.205	-0.141
P-value	0.003*	0.753	0.000 *	0.613	0.540	0.232	0.234	0.000 *	0.003 *

.

5.4.2 Part two: the relationship between PTSD and the independent variables.

This section presented the relationship between PTSD and other independent variable such as (age, place of residency, educational level, economic status, marital status, type of cancer, cancer treatment and duration since diagnosis) by using Chi-Square test.

Table (5.14) showed that there were significant differences at (p=0.02) between PTSD symptoms severity scores attributed to the age. For example, the results showed that 46.9% (n=23) of participants in the age group (20 to<40 years old) had mild PTSD symptoms,

38.8% (n=19) had moderate PTSD symptoms and only 2% (n=1) of the participants had severe PTSD symptoms. For the age group (40 to <50 years old), 72.6% (n=45) had mild PTSD symptoms, 21% (n=13) had moderate PTSD symptoms and 3.2% (n=2) of the participants had severe PTSD symptoms. While for the participants in the age group (50 to <60 years old), 69.7% (n=46) had mild PTSD symptoms, 21.2% (n=14) had moderate PTSD symptoms and only 1.5% (n=1) had severe PTSD symptoms. Further, regarding (>=60 years old) age group, 78.9% (n=60) had mild PTSD symptoms, 17.1% (n=13) had moderate PTSD symptoms and only 1.3% (n=1) had severe PTSD symptoms. Standardized residuals results showed that the age group (20- <40 years old) had no PTSD more than expected, mild PTSD less than expected and moderate PTSD more than expected, however there was no differences between expected and resulted PTSD counts in all other age groups. Generally, this indicated that if PTSD symptoms were present in young age it would be in favor of moderate rather than mild symptoms.

Finally, there were significant differences at p-value (p=0.04) between PTSD severity scores due to cancer type. As shown in table (5.14), 57.9% (n=22) of the participants who had other cancer types rather than breast cancer had mild PTSD symptoms, whereas 36.8% (n=14) had moderate PTSD symptoms and 2.6% (n=1) had severe PTSD symptoms. On the other hand for the patients with breast cancer, 70.7% (n=152) had mild PTSD symptoms, 20.9% (n=45) had moderate PTSD symptoms and 1.9% (n=4) had severe PTSD symptoms. The standardized residuals results showed that the other cancer types had moderate PTSD more than expected. Generally, this indicated that patients with cancer types such as (colon, stomach, bone , endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma) had more PTSD symptoms than patients with breast cancer .

Table (5.14): Significant relationships between PTSD severity and socio-demographic & cancer medical history (Chi Square test results, counts and percentages).

Variable/Category			PTSD				Total		
			No PTSD	Mild PTSD	Moderate PTSD	Sever PTSD		Chi Square	P-value
Age	20 - <40 years old	Count	6	23	19	1	49	17.07*	0.02
		Expected count	2.9	33.7	11.4	1			
		Count %	12.2%	46.9%	38.8%	2.0%	100.0%		
		Std. residual	1.8	-1.8	2.2	0			
	40- <50 years	Count	2	45	13	2	62		
		Expected count	3.7	42.6	14.5	1.2			
		Count %	3.2%	72.6%	21.0%	3.2%	100.0%		
		Std. residual	-0.9	0.4	-0.4	0.7			
	50 - <60 years	Count	5	46	14	1	66		
		Expected count	3.9	45.4	15.4	1.3			
		Count %	7.6%	69.7%	21.2%	1.5%	100.0%		
		Std. residual	0.5	0.1	-0.4	-0.3			
	>=60	Count	2	60	13	1	76		
		Expected count	4.5	52.3	17.7	1.5			
		Count %	2.6%	78.9%	17.1%	1.3%	100.0%		
		Std. residual	-1.2	1.1	-1.1	-0.4			
Total		Count	15	174	59	5	253		
		Count %	5.9%	68.8%	23.3%	2.0%	100.0%		
Cancer Type	Other CA	Count	1	22	14	1	38	4.49*	0.04
		Expected count	2.3	26.1	8.9	0.8			
		Count %	2.6%	57.9%	36.8%	2.6%	100.0%		
		Std. residual	-0.8	-0.8	1.7	0.3			
	Breast cancer	Count	14	152	45	4	215		
		Expected count	12.7	147.9	50.1	4.2			
		Count %	6.5%	70.7%	20.9%	1.9%	100.0%		
		Std. residual	0.4	0.3	-0.7	-0.1			
Total		Count	15	174	59	5	253		
		Count %	5.9%	68.8%	23.3%	2.0%	100.0%		

***Significant at 0.05 level.**

5.4.3 Part three: the relationship between QOL and PTSD

This final analysis of the results represents the relationships between QOL domains (physical function, role function, social functioning, emotional functioning and cognitive functioning domains and global quality of life) and PTSD by using regression analysis. The results were revealed that there was a significant negative relationship between PTSD and physical function (r = -0.32), role function (r = -0.38), social functioning (r = -0.48), emotional functioning (r = -0.57) and cognitive functioning domains (r = -0.23) and global quality of Life (r = 0.46). This means that as GQOL and the functional domains decreased, PTSD symptoms increased. The strongest relationship was with emotional function indicating that when emotional function decreased PTSD symptoms increased as shown in table (5.15).

On the other hand, there was a significant positive relationship between PTSD and pain (r = 0.43) fatigue (r = 0.48), nausea and vomiting (r = 0.28), dyspnea (r = 0.20), insomnia (r = 0.52), loss of appetite (r = 0.40) and constipation (r = 0.31). This means that as these symptoms increased, PTSD symptoms increased. The strongest relationship was with insomnia and the weakest one was with dyspnea.

Moreover , Pearson correlation results showed that there was a significant positive relationship between PTSD and financial impact (r= 0.21). This means that the increase on financial impact of cancer was associated with increase in PTSD symptoms as shown in table (5.15).

Table (5.15): Regression Analysis to assess the relationships between PTSD and QOL domains.**

Dependent Variable	Pearson Correlation r	r Square	F-value ANOVA	P-value	B-value (Regression)	P-value
Physical Function	-0.32	0.10	29.37	0.001	-14.87*	0.001
Role Function	-0.38	0.15	43.48	0.001	-21.28*	0.001
Social Functioning	-0.48	0.23	75.08	0.001	-20.63*	0.001
Emotional Functioning	-0.57	0.32	120.58	0.001	-26.91*	0.001
Cognitive Functioning	-0.23	0.05	14.33	0.001	-10.44*	0.001
Pain	0.43	0.19	57.43	0.001	19.57*	0.001
Fatigue	0.48	0.23	73.85	0.001	21.90*	0.001
Nausea and Vomiting	0.28	0.08	21.11	0.001	10.94*	0.001
Dyspnea	0.20	0.04	10.33	0.001	10.89*	0.001
Insomnia	0.52	0.27	94.86	0.001	36.13*	0.001
Loss of Appetite	0.40	0.16	47.02	0.001	25.29*	0.001
Constipation	0.31	0.09	26.35	0.001	19.09*	0.001
Diarrhea	-0.08	0.01	1.56	0.21	-2.80	0.21
Financial Impact	0.21	0.04	11.28	0.001	11.41*	0.001
Global Quality of Life	-0.46	0.21	66.16	0.001	-15.06*	0.001

***Significant at 0.05 level.**

****Independent Variable: PTSD.**

Finally, regression analysis with covariate control was used to assess if there were confounders in the relationship between quality of life and PTSD, and the results were adjusted to age, cancer type and cancer treatment as shown in table (5.16).

The results showed that there was a significant negative relationship between PTSD and physical function, role function, social functioning, emotional functioning and cognitive functioning domains and global quality of life when adjusted to age and type of cancer. This means that the relationship in table (5.15) between GQOL and the functional domains and PTSD was a real relationship, and not as a result of the possible confounders (age and cancer type).

Also, there was a significant positive relationship between PTSD symptoms and pain, fatigue, nausea and vomiting, dyspnea, insomnia, loss of appetite, and constipation when adjusted to age, cancer type and treatment. This means that the

relationship in table (5.15) between these symptoms and PTSD symptoms was a real relationship not as a result of the possible confounders.

Finally, table (5.16) showed that there was a significant positive relationship between PTSD symptoms and financial impact. This means that the relationship between financial impact of cancer and PTSD symptoms was a real relationship , and not as a result of the possible confounders.

Table (5.16): Adjusted relationships between PTSD and QOL.**

Dependent Variable	Multiple Correlation r	r Square	F-value ANOVA	P-value	B-value (Regression)	P-value
Physical Function	0.53	0.28	23.93	0.00	-15.28	0.001*
Role Function	0.46	0.21	16.29	0.00	-20.82	0.001*
Social Functioning	0.52	0.27	22.68	0.00	-19.15	0.001*
Emotional Functioning	0.58	0.34	31.76	0.00	-26.49	0.001*
Cognitive Functioning	0.49	0.24	19.70	0.00	-11.83	0.001*
Pain	0.50	0.25	20.55	0.00	18.82	0.001*
Fatigue	0.56	0.31	28.08	0.00	21.38	0.001*
Nausea and Vomiting	0.35	0.12	8.72	0.00	9.85	0.001*
Dyspnea	0.28	0.08	5.17	0.00	11.73	0.001*
Insomnia	0.55	0.30	26.81	0.00	34.50	0.001*
Loss of Appetite	0.46	0.21	16.59	0.00	25.98	0.001*
Constipation	0.43	0.18	13.95	0.00	19.16	0.001*
Diarrhea	0.19	0.04	2.25	0.07	-3.19	0.16
Financial Impact	0.28	0.08	5.10	0.00	11.92	0.001*
Global Quality of Life	0.50	0.25	20.56	0.00	-15.16	0.001*

***Significant at 0.05 level.**

****Independent Variable: PTSD.**

*****Adjusted to : Age, Cancer type and Treatment.**

5.5 Summary:

- The global quality of life mean was 57.4; within moderate quality of life range associated with high emotional and social functioning (mean =77.8 and 87.7 respectively).
- The study showed a significant negative relationship at ($p<0.05$) level between the severity of pain, fatigue, loss of appetite symptoms with GQOL.
- The study findings revealed that the prevalence of PTSD symptoms was 3%. While the prevalence of severe PTSD symptoms was 2%, moderate PTSD symptoms was 23.3% and mild PTSD symptoms was 68.8%.
- The study found statistically significant relationships at ($p<0.05$) between quality of life and age group, educational level, economic status, number of family members, care-giving person , cancer type and treatment.
- The predictors of poor QOL are old age, low income, low educational level and dependent on self as care-giving. The finding revealed that other cancer types rather than breast cancer and combination of all treatment types of cancer are related to poor QOL.
- The findings revealed statistically significant relationships at level ($p<0.05$) between PTSD and age group, number of family members and cancer type.
- The findings did not show statistically significant relationships between PTSD and marital status, education Level ,place of residence, economic status, cancer treatment and length of cancer diagnosis.
- The study revealed a significant negative relationship between GQOL and QOL functional domains and PTSD when adjusted to age and type of cancer.
- The study revealed a significant positive relationship between each of pain, fatigue, nausea and vomiting, dyspnea, insomnia, loss of appetite, constipation and financial impact of cancer and PTSD when adjusted to age, cancer type and treatment.

The next chapter discussed the findings of current study.

Chapter Six

Discussion

6.1. Introduction

This chapter discussed the major findings of the current study and the interpretation of its findings in relation to previously conducted studies found in literature review. This study aimed to assess the quality of life of adult female patients with cancer attended Beit-Jala Governmental Hospital as well as studying its correlation with one of anxiety disorders, which is PTSD.

The participants' characteristics and their responses to the questionnaire items, the relationships between dependent and independent variables by using many statistical analyses tests such as ANOVA test, t-test and chi-square test were discussed in 4 sections as the following:

6.2. Section one: The characteristics of the participants, cancer medical history and psychological history.
6.3. Section two: Quality of life and PTSD symptoms findings.
6.4. Section three: The relationship between dependent and independent variables.
6.5. The relationship between quality of life and PTSD
6.6. Conclusion
6.7. limitations and recommendations.

6.2. Section one: the characteristics of the participants, cancer medical history and psychological history.

The study targeted female patients with cancer aged from 18 years old and older. The findings showed that from 253 female patients with cancer aged 18 and above, more than half of them (56.1%, n=142) were 50 years old and above, and 43.9% (n=111) were below 50 years old. This may indicate that the number of cancer cases increase by age. The Palestinian statistical reports in the years 2013 and 2014 showed that the trend in the top ten cancer reported cases in females increase with age (PMoH, 2014) and that (60%) were 50 years old and above and (40%) were below 50 years old (PMoH, 2014).

Also, the findings showed that 85% (n=215) of the study participants had breast cancer and the mean age was 52.6 years. The minimum age was 20 years old and the maximum age was 81 years old. These findings were consistent with the Palestinian Ministry of Health statistics in the years 2013 and 2014 which showed that the mean age of female reported cases with breast cancer was 52.7 years old and 51.5 years old respectively (PMoH, 2013, 2014).

For the marital status, the majority of the participants were married and widows (93.3%, n=236), while only 6.7% (n=17) were single. Odeh cohort study (2011) that assessed epidemiological indicators among Palestinian women who had breast cancer showed a similar result as 91.3% of the participants were married and 8.4% were singles (Odeh, 2011). This finding might be in contrary to what was reported in the literature which showed higher rates of cancer (especially breast cancer) among women who were never married (Bevers et al., 2014; Ebrahimi et al., 2002; Osborne et al., 2005). On other hand, one recent study in USA showed that marriage increased cancer survival rate and being unmarried is associated with worse overall survival compared with being married, with up to 24% higher mortality among males and 6% higher mortality among females (Martínez et al., 2016). This suggest further studies to assess the relationship between marriage and cancer morbidity among Palestinian women including other risk factors such as reproductive health, hormonal therapy replacement, family history exposure to radiation, and lifestyle (Gong et al., 2013; Nee, 2013).

Further, the results showed that the majority of the participants had low educational level, as 62.4% of them had an educational level less than secondary education. This is

considered higher than Khleif's & Imam study (2013) in which (57.1%) of the participants (males and females) had an educational level less than secondary education. Palestinian Central Bureau of statistics latest report indicated that female Illiteracy rate was three and half times higher than that of males as 5.6% of Palestinian females were illiterates compared with 1.6% of males in 2014. (PCBS, 2015b). Many studies reported a strong negative associations between education and cancer risk (Hussain et al., 2008; Leuven et al., 2014; Tavani et al., 1999). For example, a large case control study was conducted bt Tavani et al. to assess such a relationship and the results showed that the risk of cancer was increased in low educated people (Tavani et al., 1999). This might be because educated women have more resources to devote to preventive and curative health care, prefer longer and healthier lives, are more able to detect cancer early, and are better informed on how to seek and respond to the cancer treatments (Leuven et al., 2014).

Additionally, for the economic status, the study findings showed that the majority of the participants (64%) had monthly income less than 2000 NIS. This is even below the poverty line in Palestine that is calculated to be (2293 NIS) (PCBS, 2012). Also, Khleif's & Imam study (2013) showed higher percentage than the current study as 75.2% of the participants had income less than 2000 NIS (Khleif & Imam, 2013). Many studies showed a relationship between income and cancer particularly breast cancer. Findings showed that high socioeconomic class has more risk for breast cancer than low socioeconomic class. This is attribute to their high life style in addition to reproductive factors such as low parity, later age of the first pregnancy, greater body weight, lower lactation duration and exposure to exogenous hormones (Braaten et al., 2004; Hussain et al., 2008; Kogevinas et al., 1997; Melnychuk, 2009; Robert et al., 2004). Other studies showed that low socioeconomic class is a risk for cancer because it affects people ability to get health care and they are less likely to get cancer screening tests, so their cancer is often found at a later stage, when it causes symptoms and need aggressive treatment (CDC, 2014).

For place of residency, the majority of the study participants were from Hebron representing (64.8%) of the sample, while (31.7%) of the participants were from Bethlehem and (3.1%, 0.4%) were from Ramallah and Jerusalem respectively. This is consistent with the reported female cancer cases in Palestine in the years 2013 and 2014 where Hebron: Bethlehem reported cases ratio was 2:1 (PMoH, 2013, 2014). For example, the number of reported female cancer cases from Hebron was 221 cases and 101 cases were from Bethlehem (PMoH, 2014).

Interestingly, 58.5% (n=148) of the participants were from villages, 37.5% (n=95) were from cities and 4% (n=10) were from refugee camps. The Palestinian Central Bureau of statistics latest report indicated that the percentage of urban population at the mid of 2015 was 73.9%, while the percentages of population in rural and camps areas were 16.7% and 9.4% respectively (PCBS, 2015). The World Health Organization stated that urbanization increased pressures of mass marketing, availability of unhealthy food choices and accessibility to automation and transport. All of them have an effect on lifestyle that directly affect health and increased cancer incidence (WHO, 2010). The current study finding might be explained by the fact that convenience sampling method was used to select the participants so women from villages might accept more to participate in the study than women from cities or camps. Another explanation might be because women from villages tended to receive free treatment for their cancer in Beit-Jala Governmental Hospital and women from cities may seek treatment in other places such as Israel or Jordan while women from refugee camps may receive their treatment through UNRWA services.

For cancer medical history, the study results showed that 85% of the participants (n=215) had breast cancer whereas the percentage of all other cancer types (such as colon, stomach, bone, endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma) was 15% (n=38). The Palestinian Ministry of Health statistics (2014) showed that breast cancer contributed to 48.3% of cancer reported cases in women aged 18 years old and above. The high percentage of the participants with breast cancer in the current study could be explained by the fact that all patients with breast cancer require chemotherapy treatment in addition to surgery (Andreoli et al., 2009) and Beit-Jala Governmental hospital is the only referral hospital for chemotherapy treatment in the south of West Bank. Other types of cancer (e.g. ovarian, Non-small lung cancers, uterus, leukemias, Non-Hodgkin lymphoma and brain cancer) will be referred to other treatment centers for special treatment options such as a radiotherapy in Augusta Victoria Hospital in Jerusalem which is not available in Beit-Jala Governmental hospital.

Furthermore, the majority of the study participants were treated with a combination of treatments for their cancer, as (73.9%) had a combination of chemotherapy and surgical therapy and 4% of the participants were treated with other treatment modalities such as combinations of chemotherapy, surgical and radiotherapy while (22.1%) were treated with chemotherapy only. It was found that Palestinian women tended to have locally advanced disease when their cancer is detected and a large size of tumor at the time of diagnosis so

mastectomy is still performed in more than 80% of women with breast cancer (El Saghir et al., 2007; Nissan et al., 2004; Odeh, 2011).

Regarding psychological history, seven open ended questions were used in the current study to assess this aspect and findings revealed that none of the participants reported having any psychological problems before or after cancer diagnosis, none of them reported receiving psychological treatments and none of them reported thinking about harming themselves after being diagnosed with cancer. This finding may be explained in different ways. First, psychological problems or mental problems are associated with stigma, so the participants may hesitate to report these problems. Second, feeling sad or worried might be considered normal reactions to stressors including cancer diagnosis among Palestinian women and it does not require treatment. Third, lack of knowledge among these women about mental health problems and services in the Palestinian community.

6.3. Section two: QOL and PTSD findings.

This section discussed the quality of life results with its domains in comparison with national and international studies. EORTC reference values manual was used as baseline international values for QOL domains.

6.3.1 Quality of life and its domains

In general, the findings of the current study showed low general quality of life and the majority of the participants reported having problems mainly in the physical function domain of quality of life as the statistical analysis showed lower values than EORTC reference in GQOL (mean= 57.4%) and physical functioning domains (48.5 %). In addition, these results were supported when the participants were asked to rate their overall quality of life and general health, and less than half of them (48.2%) rated them as good (between 5-7), 33.2% rated them as (not good, not bad) (4) and 18.6 % rated them as poor (1-3). On other hand, other domains of QOL indicated good functioning particularly social functioning (mean=87.7%), then emotional functioning (mean= 77.8%), cognitive functioning (mean= 77%) and role functioning (mean =64.3%) .

As mentioned previously, general quality of life is considered low for female patients with cancer as the results showed that the mean of global QOL was (57.4%) and it is lower than

the female international reference value created by EORTC group (59.3%). However, this mean difference is higher than other national studies. For example, Khliefs & Imam' study (2013) showed a global QOL mean of (41.8%), and the calculated linear transformation of the global quality of life of patients with breast cancer in Palestine by Samara & Saca study (2009) was (49%) while the mean of global quality of life of patients with breast cancer in Kuwait was 45.3% (Alawadi & Ohaeri, 2009). On the other hand, the mean of global quality of life of patients with breast cancer in Turkey was more higher than the current study (62.8%) (Demirci et al., 2011).

The domain that might affect negatively quality of life in the current study was physical domain where the mean was (48.4%) compared to (74.4%) in the female international reference value created by EORTC group. Also, the results in the current study revealed that about (30%) of the study participants had physical function score less than 33% cut off point which indicated very poor functioning. Physical function questions were the only questions were the majority (>60%) of the participants reported problems or difficulty "very much" and "quite a bit".

These results were consistent with Khleifs' &Imam study (2013) which showed that the mean of physical function was (48.5%), while (25.7%) of the participants had physical function score below 33% cut off point (Khleif & Imam, 2013). Also, Pinar et al. found that the troublesome domains of quality of life of patients with cancer were the psychological and the physical domains (Pinar, Salepc, & Affiar, 2003). Meanwhile, Ferrell et al. (1997) stated that cancer survivors had several problematic physical effects that influence their ability to function and negatively influence their overall QOL and the most common symptoms affected physical well-being were pain and fatigue (Ferrell et al., 1997).

In the current study, physical domain was investigated in depth by asking the participants about "trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase", and 55.3% of the participants answered that they faced very much problems. For "trouble for taking a long walk", 48.6% of the participants answered that they faced problems very much, and for "trouble taking a short walk outside of the house" 32.8% the participants answered that they faced very much trouble. It was found that patients with cancer have several problematic physical effects that influence their ability to function and negatively influence their overall QOL (B R Ferrell, 1996). National Health Interview

Survey (NHIS) data showed that cancer survivors without any other chronic illnesses were more than twice as likely as individuals without a history of cancer or other chronic illness to report limitations in their ability to perform activities of daily living and significantly more likely to have other functional limitations (Hewitt, Rowland, & Yancik, 2003). Also, a study that assessed physical functioning in patients with breast cancer reported a decline in physical functioning following breast cancer diagnosis (Sehl et al., 2012).

The high social and emotional functioning may be attributed to the fact that patients' social supports (family members and friends) provided substantial emotional, informational, and logistical support, as patients with cancer who had sufficient support groups had better emotional functioning (Adler, 2008). Other studies showed lower emotional functioning mean. For example, Samara & Saca (2009) reported low mean of emotional function (44%) (Samara & Saca, 2009) and Alawadi & Ohaeri, (2009) reported a mean of (60.3%). Bani-Odeh, (2013) qualitative study explored Palestinian females knowledge, attitude and practice among female patients of MOH clinics towards being diagnose with breast cancer and showed that breast cancer diagnosis was associated with scare, fear and hopelessness (Bani-Odeh, 2013). This disparity in the findings of different studies regarding emotional function could be due the social support system and the cultural factors characterizing the different areas from which the participants were recruited or to the cancer types or prognosis that these participants had.

Furthermore, the results revealed that role functioning was more towards good functioning. The mean in the current study was (64.3%) whereas 80% of the participants were in the good functioning range represented in > 66% cut off point. These results were not supported by Khleif's & Imam study (2013) were the mean of role functioning was (48.8%) and 47.1% of the participants were in the good functioning score i.e. > 66% cut off point (Khleif & Imam, 2013). Also, Alawadi & Ohaeri (2009) found that the mean of role functioning for women with breast cancer was (55.1%) and (39.1%) of the patients were in the good functioning range (Alawadi & Ohaeri, 2009). On other hand, another study reported a high mean for role function which was 83.5% (Demirci et al., 2011). Kootstra et al. (2008) evaluated QoL of patients with breast cancer and suggested that the timing of QOL assessment regarding surgical and chemotherapy complications had a significant effect on role, emotional and cognitive functioning (Kootstra et al., 2008).

Finally, about 74% of study participants reported a good cognitive functioning (>66% cut off point). However, the mean of cognitive functioning was low (77%) in comparison with the EORTC reference mean value but higher than both Khleifs and Imam (2013) study and Alawadi & Ohaeri study (2009) with means of 60.5% and 59.9% for cognitive function respectively (Alawadi & Ohaeri, 2009; Khleif & Imam, 2013). Cognitive differences were observed in patients with breast cancer patients receiving chemotherapy compared with healthy controls (Brezden et al., 2000; Mandelblatt et al., 2014). Hermelink et al. (2015) reported that women with breast cancer had limited cognitive impairment after their cancer diagnosis (Hermelink et al., 2015).

Symptoms scale of QOL

Regarding symptomatic scale in QOL questionnaire, all means of symptoms were around the international reference value with a higher standard deviation from the mean.. Interestingly, insomnia was the most reported symptom followed by loss of appetite, constipation and finally fatigue. The current study results showed that (34.78%) had severe insomnia,(32.8%) have severe loss of appetite, (24.1%) had severe constipation and (20.55%) had severe fatigue. These results were supported in literature by other studies. For example one study included women with breast cancer reported severe insomnia (39.3%) , severe loss of appetite (32.7%), severe constipation (22%) and severe fatigue (13.6%) (Alawadi & Ohaeri, 2009). Another study indicated that insomnia among patients with breast cancer was 18.46%, and clinically significant insomnia was highly associated with joint pain, hot flashes, anxiety and depression, age, and time since breast cancer diagnosis (Desai et al., 2013).

The Institute of Medicine Committee on Psychosocial Services to Cancer Patients/Families in a Community Setting (USA) showed that fatigue is the most frequently reported symptom in patients with cancer and is identified as causing the greatest interference with patients' daily activities (Adler, 2008). Estimates of rates of fatigue among women with cancer vary greatly ranging from 4 percent in breast cancer patients prior to the start of chemotherapy to 91 percent in breast cancer patients after surgery and chemotherapy (Carr et al., 2002). Meanwhile, studies reported a low incidence of chronic pain in patients with breast cancer ranging from 8% to 14% (Desai et al., 2013; Goudas, Bloch, Gialeli-Goudas, Lau, & Carr, 2005; Rowan et al., 2014). These findings could be attributed to the fact that in general the majority of patients with breast cancer require chemotherapy treatment

which has many side effects such as fatigue, headaches, nausea and vomiting, appetite loss, hair loss and low immunity and radiotherapy which is associated more with pain and fatigue than chemotherapy (Chawla, 2012). In the current study, 85% of the participants had breast cancer and 96% of them were taking chemotherapy. Also, in Alawadi & Ohaeri study (2009), 98% of the participants were taking chemotherapy (Alawadi & Ohaeri, 2009).

However, when analyzing the association between these symptoms and GQOL, there were significant negative associations between pain, fatigue and loss of appetite and global quality of life. The strongest relationship was between GQOL and fatigue followed by pain and then loss of appetite. As mentioned previously, fatigue is the most frequently reported symptom in patients with cancer (Adler, 2008). Many studies demonstrate the association between fatigue and pain and QOL. For example, one study assessed the role of the symptom scales in predicting health-related QOL and found that fatigue was the most important predictor of QOL (Arndt et al., 2006). Also, Pud (2011) showed a negative correlation between pain intensity and QOL as well as positive correlations between pain intensity and fatigue in females patients with cancer (Pud, 2011). In addition, a study measured the QOL in patients with solid tumors and at the different chemotherapy cycles (CT) addressed a significant relationship between the cancer type, pain intensity, and fatigue and GQOL (Heydarnejad et al., 2011). Other studies showed that appetite loss, pain and fatigue were the most important or strongest independent predictors of survival on different cancer populations (Efficace et al., 2004; Montazeri, 2009).

As cancer-related fatigue affects the physical function of those patients and their overall quality of life. So including physical activity in the treatment plan for cancer related side effects is important to improve the patients' quality of life (Gates & Fink, 2008; Network, 2014). Literature indicated the importance of physical activity to improve quality of life of patient with cancer; and an Italian study included 212 woman with breast cancer showed a significant relationship between physical exercise and the QOL (Valenti et al., 2008). Another study assessed QOL related to exercise in 1,829 Chinese women diagnosed with breast cancer and the results showed that regular exercise after breast cancer diagnosis improved QOL (Lu et al., 2009). So including physical activities with professional supervised exercises to patients with cancer can improve their physical function and hence improve their QOL. This should be implanted free of charge in cancer treatment protocol that is offered by the Palestinian Ministry of Health.

6.3.2 PTSD symptoms findings

Prevalence rates of breast cancer related PTSD varied from 3% tom 19% in the literature (Darshit et al., 2015) . PTSD symptoms were assessed in the current study by using≥ 50 cutoff point for posttraumatic stress disorder for clinical diagnosis and the prevalence of PTSD in the current study was (3%, n=8) . This relatively low PTSD rate is consistent with those of Alter et al.(1996) and Cordova et al.(1995), who reported PTSD prevalence of 4% and 5% -10% in patients with cancer (Alter CL et al., 1996; Cordova et al., 1995). Other studies showed higher percentage of PTSD symptoms. For example, a study that was conducted in Germany to measure psychosocial co-morbidity and quality of life (QOL) , PTSD was assessed using PCL-C and posttraumatic stress disorder was observed in 12% (Mehnert & Koch, 2008). Also, a recent study showed that the prevalence of PTSD symptoms was 10.7% (Chan et al., 2011). Further, a study where a total of 100 women with breast cancer were assessed using Impact Event Scale (IES) for PTSD showed that 5% of the participants had PTSD symptoms at any time post cancer diagnosis (up to 20 months) or treatment (Alkhyatt et al., 2012).

By using ≥53 as a cutoff point for severe PTSD symptoms (Weathers et al., 1991), the prevalence was (2%, n=5) for severe symptoms, (23.3%, n=59) for moderate symptoms and (68.8%,n=174) for mild symptoms. This result means that 94.1% of the participants had PTSD symptoms and only 5.9% did not have. Therefore, interventions to treat mild, moderate and severe PTSD symptoms should concentrate on improving psychological wellbeing of women with breast cancer. These interventions aim to improve psycho-social involvement, psychological understanding, religious involvement, positive mental changes and reducing effects of PTSD in female patients with cancer especially patients with breast cancer (Darshit et al., 2015). Andreu et al., (2012) revealed in a study of 102 breast cancer survivors that psychological factors, strategies for coping with treatment and gaining social support from community and family were conducive to improved psychological status and thus improving the quality of life of patients with cancer (Andreu et al., 2012).

Levine and colleagues found that that early psychological interventions effectively reduced PTSD and psychological distress after breast cancer diagnosis (Levine, Eckhardt, & Targ, 2005). So psychological treatment and assessment should be integrated into governmental hospitals to treat PTSD symptoms among female patients with cancer.

6.4. Section three: the discussion of the relationship between QOL, PTSD and independent variables.

This section discussed the relationship between the quality of life, PTSD and other independent variables including socio-demographic data and cancer medical history for female patients with cancer.

6.4.1. The relationship between quality of life and age.

The current study findings revealed a statistically significant relationship between global QOL, the four functional and all symptoms domains of QOL and age group. The relationships were different with different domains in relation to age groups. For example, younger patients with cancer had better physical function, role functioning and cognitive function while older patients had better social function, global QOL and they had more pain & fatigue. These findings are consistent with Khleif's & Imam study where younger patients had better physical and role functions and less fatigue (Khleif & Imam, 2013). Also, Pinar et al. (2003) revealed a significant negative association between age and physical function, as age of patients with cancer increased, the physical function decreased (Pinar et al., 2003). On contrary, another study did not express any significant association between age and any of QOL domains (Alawadi & Ohaeri, 2009).

6.4.2. The relationship between quality of life and place of residence

In addition, the study findings revealed a statistically significant relationship between financial impact of cancer and place of residence. The results showed that female patient with cancer living in a village or a camp had higher financial impact of cancer than those living in the city. Financial impact was especially noted in those who were living in camps and there were not any significant relationship between place of residence and all other QOL domains. On other hand, Khleif's & Imam (2009) study showed no significant correlation between financial impact and place of residence. However, it revealed a significant correlation between QOL domains and southern or northern regions in the West bank in which the participants from southern regions had poorer QOL in all domains and had more fatigue and financial difficulties than the participants from northern regions of Palestine (Khleif & Imam, 2013).

The higher financial impact of cancer in refugee camps may be because of the documented higher poverty in camps than other West Bank areas. For example, 38.6% of the refugee camp households suffered from poverty compared to 29.5% and 29.3% for rural and urban households, respectively. So, the participants from refugee camps may suffer more from the extra expense for cancer treatment such as the travelling expense to Beit-Jala Governmental Hospital for chemotherapy sessions (PCBS, 2008).

6.4.3. The relationship between quality of life and educational level

Further, the study findings revealed a significant relationship between the physical, cognitive and emotional functioning domain of QOL, and educational level. Female patient with breast cancer who had university education had better physical and cognitive functioning but they had low emotional functioning. Financial impact of cancer was significant among illiterate group. The same results were found in literature; Pinar et al. (2003) assessed quality of life of patients with cancer and found that illiterates had the lowest QOL score (Pinar et al., 2003). The better QOL in educated patients may be due to better coping mechanisms, better access, and/ or finding and benefiting from resources (Güner et al., 2006).

For emotional function results, the low emotional function in patients with university level may attribute to their better communication with doctors about their disease. This was supported by a qualitative research which revealed that the more the patients understand their symptoms the better their emotional function; for example, '... if I could understand what was happening to my body, then I could understand the symptoms, then they wouldn't be frightening...' (Van der, 2009). They revealed that communication with patients was the second greatest predictor of quality of life in patients with breast cancer (Engel et al., 2003).

6.4.4. The relationship between quality of life and economic status

In addition, the findings showed a statistically significant relationship between the QOL and economic status. The findings revealed that quality of life was better for the participants with high economic status in physical, cognitive and global Quality of life domains. On the other hand, participants with low economic level patient with cancer had better social functioning and more financial impact of cancer.

The same results were obtained in other studies (Alawadi & Ohaeri, 2009; Güner et al., 2006; Khleif & Imam, 2013). These studies showed that higher income was associated with better quality of life. Also, Khleif & Imam revealed by in-depth interviews that lower economic level is associated with more financial difficulties on patients with cancer (Khleif & Imam, 2013).

This may be attributed to the fact that most of the patients with cancer may lose their job after they got the disease, in addition to the extra expenses associated with treatment and most of the patients with cancer had low income as 64% of the current study participants had monthly income less than 2000 NIS.

6.4.5. The relationship between quality of life and marital status

Regarding marital status, findings revealed that married female patients with cancer had better physical and role functions while singles had better cognitive function. Also, a study aimed to evaluate the impact of socioeconomic status on the altered appearance distress, body image, and quality of life among Korean patients with breast cancer revealed that married women and who had higher education had better quality of life (Chang et al., 2014). On the contrary, the Turkish study that assessed the quality of Life for patients with cancer found that higher QOL was among unmarried and related that for less responsibilities they had (Güner et al., 2006). The current study finding could be explained by the fact that Palestinian women with cancer continue to carry out their responsibilities towards their family and children even when they are sick particularly that they did not suffer from much pain or fatigue as reported by them in the current study. Further qualitative studies are required to assess the relationship between marital status and quality of life domains.

6.4.6. The relationship between quality of life and cancer type.

Regarding to the relationship between QOL and cancer type, the results revealed that patients with breast cancer had better physical function, role functioning, and social functioning than other types of cancer (such as colon, stomach, bone, endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma) and less pain and fatigue than other cancer types. This finding is similar to other studies which assessed the QOL of patients with different cancer types and showed that breast cancer had better QOL than other types of cancer while gastrointestinal cancer and lung cancer types had the lowest quality of life

(Heydarnejad et al., 2011; Pinar et al., 2003) . This could be as a result of better prognosis of breast cancer in early stages with acceptable treatment side effects than other types of cancer (Andreoli et al., 2009).

6.4.7. The relationship between quality of life and onset of cancer diagnosis.

The study revealed no significant relationship between QOL domains and length of cancer diagnosis except with cognitive functioning where the shorter the duration of diagnosis with cancer, the better cognitive function was. This is consistent with Pinar et al., (2003) findings which showed no significant relationship between the onset of cancer diagnosis and QOL (Pinar et al., 2003). Also, another study that assessed the predictors of quality of life of patients with breast cancer revealed no change on QOL of breast cancer patients on three years follow up (Engel et al., 2003). On the other hand, Alawadi & Ohaeri (2009) showed that the time since chemotherapy was a significant covariate for cognitive function (Alawadi & Ohaeri, 2009). Also, a systemic review showed that cognitive function of patients with breast cancer was low for patients who had received multiple chemotherapy sessions, the risk of cognitive impairment was 8.2 times higher than that of control subjects and it was 3.5 times higher than that of patients who had undergone one-dose chemotherapy (Phillips & Bernhard, 2003). The finding of the current study might be explained by the fact that 96% of the participants were taking chemotherapy treatment, which may affect the cognitive function.

6.4.8. The relationship between quality of life and cancer treatment.

Furthermore, the only significant association with cancer treatment was with role functioning domain in QOL. The results revealed that patients who had (Chemotherapy and surgery) as a treatment for their cancer, had better role function than patient who received other treatment modalities (such as combinations of chemotherapy, surgical and radiotherapy). The current study finding is consistent with Pinar et al., (2003) who reported no significant association between the types of treatment an QOL (Pinar et al., 2003).

As mentioned previously, cancer treatment had a significant relationship with role functioning might be explained by the fact that treatment related side effects may affect role functioning as patients with a combination treatment of chemotherapy, surgical and radiotherapy experience more pain and fatigue than those who had chemotherapy and surgery. The results were supported by a study that assessed QOL of breast cancer where

there was significant association between radiotherapy treatment and pain and fatigue (Alawadi & Ohaeri, 2009).

In summary, this study revealed that the predictors of poor QOL among female patients with cancer in Beit-Jala Governmental Hospital were: old age, low educational level , low economic class, being unmarried, low number of family members and dependence on others for care.

Different domains had different association with each socio-demographic and cancer medical history variables. Table (6.1) summarizes the factors associated with poor QOL in relation to functional domains, significant symptoms and financial difficulties.

Table (6.1) The factors which were associated with poor QOL in relation to GQOL, functional domains, significant symptoms and financial difficulties.

QOL	Significant predictors of poor QOL ($p<0.05$)
GQOL	Old age, low economic status.
PF	Old age, low educational level, low income, widow/single , low number of family members, dependence on others for care and having other than breast cancer.
RF	Old age, widow/single, other than breast cancer as cancer diagnosis and combination treatment.
SF	Young age, higher income, and having other than breast cancer.
EF	Higher educational level
CF	Old age, low educational level, low income, being married , low number of family members, being dependent on others for care and longer duration of cancer diagnosis.
PA	Old age, being dependent on others for care, had other than breast cancer and combination treatment.
FA	Old age, being dependent on others for care, had other than breast cancer , and combination treatment.
FI	Living in camp/village, low educational level, low income and being widow

The variables that did not show a significant relationship with QOL domains are shown in table (6.2).

Table (6.2) variables that showed no relationship with QOL domains.

QOL	No relationship found
GQOL	Place of residence, educational level, marital status, family members number, caregiver person, type of cancer, cancer treatment and length of cancer diagnosis.
PF	Place of residence, cancer treatment and length of cancer diagnosis.
RF	Place of residence, educational level, economic status, family members number, caregiver person and length of cancer diagnosis.
SF	Place of residence, educational level, marital status, family members number, caregiver person, cancer treatment and length of cancer diagnosis.
EF	Age, place of residence, economic status, marital status, family members number, caregiver person, type of cancer, cancer treatment and length of cancer diagnosis.
CF	Place of residence, type of cancer and cancer treatment.
PA	Place of residence, educational level, economic status, marital status, family members number and length of cancer diagnosis.
FA	Place of residence, educational level, economic status, marital status, family members number and length of cancer diagnosis.
FI	Age, family members number, caregiver person, type of cancer, cancer treatment and length of cancer diagnosis.

6.4.9. The relationship between PTSD and socio-demographic variables & cancer medical history

Regarding PTSD, the current study findings revealed that PTSD symptoms were more likely to present in young age. This findings is consistent with the Swedish study which showed that posttraumatic stress symptoms in patients with breast cancer tended to be associated with younger age (Perez et al., 2014). Also an Iraqi study that assessed post-traumatic stress in women with breast cancer showed that younger women were at a greater risk for PTSD symptoms than older women (Alkhyatt et al., 2012).

Further, the study findings showed that PTSD symptoms were more related to other cancer types such as (colon, stomach, bone , endometrium, liver, biliary, thyroid, ovarian, leukemia and lymphoma) rather than breast cancer . Alkhyatt et al. (2012) suggested that receiving a breast cancer diagnosis does not fit the PTSD model well and that the breast cancer experience does not seem to have immediate threat to life or bodily integrity usually associated with external trauma (Alkhyatt et al., 2012). On other hand, the prevalence rate of PTSD in women with breast cancer varied between 1% to 58% in literature (Darshit et al., 2015). This can be related to multifactorial causes/risk factors for PTSD in breast cancer such as cancer stage, prognosis, patient-specific treatment approaches, presence or absence of pain, performance status, need for hospitalization and degree of social support (Andrykowski & Kangas, 2010; Rizalar et al., 2014).

There were no significant relationships between cancer treatment , length of cancer diagnosis and PTSD symptoms. It has been postulated that PTSD symptoms were related to more advanced stages of cancer and more aggressive and/or longer treatment, but research findings have been equivocal (Andrykowski & Kangas, 2010). Some studies have found PTSD symptoms were associated with the completion of therapy (Bleiker et al., 2000) ,whereas others have reported symptoms months or even years after completing primary treatment (Green et al., 2000).

Also, the current study found no relationship between PTSD and place of residence, marital status, economic status and educational level. Many studies revealed the same findings; for example, one study that assessed post-traumatic stress disorder in survivors of childhood cancer found that all demographic variables were not risk factors for PTSD (DeKeyser et al., 2010). Also, another study that assessed posttraumatic stress symptoms in patients with breast cancer found that the only significant relationship with PTSD was

with age but not with other socio-demographic or medical factors (Perez et al., 2014). In addition, Hahn et al., (2015) showed that demographic factors such as gender, education, and race were not significantly associated with PCL-C scores (Hahn et al., 2015).

6.5. The relationship between quality of life and PTSD.

Finally, the current study revealed a statistically significant relationship between QOL and PTSD. Results showed a negative relationship between PTSD and physical function, role function, social functioning, emotional functioning and cognitive functioning domains and global quality of life when adjusted to age and type of cancer. This indicated that better QOL is associated with lower PTSD symptoms. The same association was expressed in a study that was conducted in USA where health-related quality of life was significantly associated with PCL-C scores (Hahn et al., 2015). In addition, reduced physical functioning was associated with PTSD symptoms in another study that assessed the prevalence and the risk factors for cancer-related PTSD symptoms in women treated for primary breast cancer (O'Connor et al., 2011). Also, another study found that altered appearance such as loss or disfigurement of breasts, discolored skin, and hair loss resulted in psychological distress and affects their quality of life (Chang et al., 2014). Further, a report indicated that psychosocial distress experienced within the first year post diagnosis has a huge impact on psychosocial wellbeing and quality of life in long term breast cancer survivors (Mehnert & Koch, 2008).

On the other hand, the results showed a significant positive relationship between pain, fatigue, nausea and vomiting, dyspnea, insomnia, loss of appetite, constipation and PTSD. It means that the increase in the severity of symptoms of cancer is associated with increase in PTSD symptoms. Jones (2001) highlighted that as the physical symptoms of the disease reduced, the symptoms of psychological distress would resolve over a period of time in the majority of women (Jones, 2001) .

As the finding indicated, PTSD symptoms interfered with patient functioning, it is the responsibility of health practitioners is to educate the patient, family, and caregivers regarding normal and expected symptoms related to diagnosis and treatment, including emotional responses. American Cancer Society (2009) recommended that health care workers should provide patients with safe and competent care that includes a

comprehensive psychosocial assessment for PTSD, individualized interventions, and referral when appropriate (NCI, 2009).

Furthermore, the study revealed a positive relationship between PTSD and financial Impact, so the increasing financial impact of cancer is associated with increase in PTSD symptoms. Patients who face life threatening diseases like breast cancer experience different stressful events including financial and social worries (Darshit et al., 2015; Rizalar et al., 2014).

6.6. Conclusion

The current study assessed the QOL and PTSD prevalence among adult females patients with cancer in Beit-Jala Governmental Hospital in Bethlehem. The findings indicated that the global QOL in the current study was lower than the female international reference value created by EORTC group. The most troublesome activities was within daily life and were reflected in the physical domain which was in the range of poor functioning. On the other hand, role functioning, social functioning and emotional functioning where more towards very good functioning. The study revealed significant association between pain, fatigue and loss of appetite with the global quality of life.

Meanwhile, the study results showed that the prevalence of PTSD symptoms was (3%). For PTSD symptoms severity, (2%) reported severe symptoms, (23.3%) reported moderate symptoms and (68.8%) reported mild symptoms based on Weathers et al. (1991) classification of PTSD symptoms severity scores. In addition, It was found that PTSD symptoms were more likely to present in young age and patients who were diagnosed with other types of cancer rather than breast cancer.

Furthermore, the study revealed a statistically significant relationship between all QOL domains and PTSD. Results showed a negative relationship between PTSD and physical function, role function, social functioning, emotional functioning and cognitive functioning domains and Global Quality of Life when adjusted to age and type of cancer. Also, there were a significant positive relationship between pain, fatigue, nausea and vomiting, dyspnea, insomnia, loss of appetite, constipation and PTSD.

So it is important that female patients with cancer undergo a careful assessment for posttraumatic stress disorder (PTSD), so that early symptoms may be identified and

treated. By identifying the most vulnerable population among patients with cancer, it will enable us to provide better health care for cancer survivors and train health professionals to support such patients in more effective way.

6.7. limitations and recommendations

6.7.1 Limitations:

There are many limitations in the current study. For example, this study utilized a cross sectional design, due to the limitation of the available time and scarcity of resources. This makes it difficult to assess accurately the magnitude of effect exerted by each factor or to differentiate precisely whether the interaction between these factors would be advised or antagonistic. Also, this type of design may have limitations in the generalization of the results to a wider population since it measures both the prevalence of the outcomes and the determinants in a population at a point in time or over a short period of time (Stephen et al., 2011). Nevertheless, the cross sectional studies are highly useful for descriptive purposes and it is relatively quick, cheap and easy to undertake (Burns & Grove, 2003).

The data collection for this study was done by using a self- administered questionnaire. So, the reliability of the results may be affected, since the participants may hesitate to express their points of view or they may describe their own thoughts, feelings or behaviors in spurious way to please the researcher (Mitchell & Jolley, 2012) . Further, the sample included patients from Beit-Jala Hospital only which may limit the generalization of findings to female patients with cancer in other settings.

6.7.2 Recommendations:

Recommendation for health policy makers

- Strengthening mental health services to offer psychological treatment for patients with cancer to improve their quality of life in the governmental hospitals.

- Provide palliative care for female patients with cancer to manage and improve physical functioning and symptoms such as pain, fatigue, nausea, vomiting and insomnia, to decrease PTSD symptoms severity and to improve overall quality of life.

- Including physical activity in the treatment plan for cancer to improve the patients' quality of life

- Increase the knowledge and the awareness of health professional in the governmental hospitals and particularly oncology departments about the importance of assessing quality of life and PTSD symptoms among women with different types of cancer through workshops or lectures.

- The Palestinian Ministry of Health might cooperate with NGOs, private and community based organizations that provide health services to women with different types of cancer to build a national plan to improve quality of life and mental health of these women in Palestine.

- Integrate PTSD screening and quality of life components for all patients with cancer particularly for young women in the governmental or NGOs oncology clinics in West Bank.

- Train primary mental and health care professional in the governmental hospitals particularly mental health counselors about QOL and PTSD symptoms assessment and treatment.

- Integrate regular assessment of quality of life for female patients with cancer every 6 months.

Recommended research in the future:

Based on the results of the study, the following research topics are suggested:

- Assessment of quality of life and PTSD symptoms among female patients with cancer in governmental and non-governmental clinical settings.

- Assessment of quality of life and PTSD symptoms among female patients with cancer in the middle and northern areas of Palestine.

- Assessment of the relationships between socio-demographic data such as age, marital status, financial issues and place of residence and other cancer risks such as reproductive health, hormonal therapy replacement, family history exposure to radiation, and lifestyle with cancer prevalence among females.

- Assessment of quality of life and PTSD symptoms among male patients with cancer in governmental and non-governmental clinical settings

- Qualitative studies to explore the factors that affect quality of life and PTSD symptoms among female patients with cancer in Palestine

- Assessment of depression and anxiety disorder among patients with cancer in Palestine.

- Qualitative studies to explore the psychological and emotional experience of female patients with cancer.

Bibliography

Aaronson, N. K., Ahmedzai, S., Bergman, B., Bullinger, M., Cull, a, Duez, N. J., … Takeda, F. (1993). The European Organisation for Research and Treatment of Cancer QLQ-C30: A quality-of-life instrument for use in international clinical trials in oncology. *Journal of the National Cancer Institute*, *85*, 365–376.

Abramson, J. ., & Abramson, Z. H. (1999). *Survey methods in community medicine, epidemiological research program evaluation clinical trials*.

Adler, N. (2008). *Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs.* (First edit). Washington, DC: Institute of Medicine (US) Committee on Psychosocial Services to Cancer Patients/Families in a Community Setting.

Alawadi, S. A., & Ohaeri, J. U. (2009). Health–related quality of life of Kuwaiti women with breast cancer: a comparative study using the EORTC Quality of Life Questionnaire. *BMC Cancer*, *9*(1), 1.

Alkhyatt, M. K., Abdullah, E. K., Ibraim, R. H., Anee, B., & Raho3, J. Al. (2012). Post-traumatic stress in women with breast cancer. *Journal of Medicine*, *46*(4), 315–319. http://doi.org/10.1080/01926180290033466

Alter CL, Pelcovitz, D., & Axelrod, A. (1996). The identification of PTSD in cancer survivors. *Psychosomatics*, *37*(137), 137–143.

American Cancer Society. (2016a). *Cancer Facts & Figures*. Atlanta.

American Cancer Society. (2016b). *What is cancer? A guide for patients and families*. Washington, DC. Retrieved from http://www.cancer.org/cancer/cancerbasics/what-is-cancer. Acsessed on Januery, 2016

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders* (Fourth edi). Washington, DC.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)* (Fifth edit). American Psychiatric Association.

Andreoli, T. E., Benjamin, I. J., Griggs, R. C., & Wing, E. J. (2009). *Cecil Essentials of Medicine* (8th ed.). Elsevier.

Andreu, Y., Galdon, M., & Dura, E. (2012). A longitudinal study of psychosocial distress in breast cancer, Prevalence and risk factors. *Psychological Health*, *27*, 72–87.

Andrew, B. (2002). The Cancer Patient and Quality of Life. *The Oncologist*, *7*(2), 120–125.

Andrykowski, M. A., & Kangas, M. (2010). *Posttraumatic stress disorder associated with cancer*

diagnosis and treatment. (P. B. Breitbart, M. S. Jacobsen, M. J. Ledernerg, & Loscalzo, & R. McCorkle, Eds.)*Psycho-oncology* (2nd ed.).

Arndt, V., , Stegmaier, C., Ziegler, H., & Brenner, H. (2006). A population -based study of the impact of specific symptoms on quality of life in women with breast cancer year after diagnosis. *Cancer*, *107*, 2496–2503.

Bani-Odeh, K. (2013). *Knowledge, Attitude and Practices among Female Patients at MOH clinics in Rammalah, Jenin and Hebron Districts*. Al-Quds University.

Bannasc, P. (2012). *Cancer Risks: Strategies for Elimination*. USA: Springer Science & Business.

Bevers, T., Ward, J., Arun, B., & Al, E. (2014). *Breast Cancer Risk Reduction* (First edit). Clinical Practice Guidelines in Oncology (NCCN Guidelines).

Blackbourne, L. H., Antevil, J., & Moore, C. (2006). *Anatomy Recall* (Second edi). Lippincott Williams & Wilkins.

Blanchard, E., Jones-alexander, J., Buckley, T., & Forneris, C. (1996). Psychometric properities of PTSD checklist (PCL). *Pergamon*, *34*(8).

Bleiker, E., Pouwer, F., Van der Ploeg, H., Leer, J., & Ader, H. (2000). Psychological distress two years after diagnosis of breast cancer: Frequency and prediction. *Patient Education and Counselling*, *40*, 209–217. http://doi.org/doi:10.1016/S0738-3991(99)00085-3

Braaten, E, W., M, K., HO, A., & E., L. (2004). Education and risk of breast cancer in the Norwegian-Swedish womenís lifestyle and health cohort study. *Intermational Jurnal of Cancer*, *110*, 579–83.

Brezden, C., Phillips, K., Abdolell, M., And, T., & Tannock, I. (2000). Cognitive Function in Breast Cancer Patients Receiving Adjuvant Chemotherapy. *Clinical Oncology*, *18*(14), 2695–2701.

Bruce, A., Chabner, M., & Chabner, E. T. (2015). *Risk Factors for Cancer*. *Merck and the Merck Manuals*.

Burns, N., & Grove, S. (2011). *Understanding Nursing Research.* (Fifth edit).

Carr, D., Goudas, L., Lawrence, D., Pirl, W., Lau, J., DeVine, D., … Miller, K. (2002). Management of cancer symptoms: pain, depression, and fatigue: summary.

CDC. (2012). *Centers for Disease Control and Prevention. Population Assessment of Health-Related Quality of Life*. *Centers for Disease Control and Prevention*. Atlanta.

CDC. (2014). Centers for Disease Control and Prevention. Health Disparities in Cancer. Retrieved from https://www.cdc.gov/cancer/healthdisparities/.

Chan, M., Ho, S., & Tedeschi, R. (2011). The valence of attentional bias and cancer-related rumination in posttraumatic stress and posttraumatic growth among women with breast cancer. *Psycho-Oncology*, *20*, 544–552.

Chang, O., Choi, E., Kim, I., Nam, S., Eon, J., Lee, S. K., … Cho, J. (2014). Association between Socioeconomic Status and Altered Appearance Distress , Body Image , and Quality of Life Among Breast Cancer Patients. *Asian Pacific Journal of Cancer Prevention : APJCP*, *15*(20), 8607–8612. http://doi.org/10.7314/APJCP.2014.15.20.8607

Chawla, N. (2012). *Navigating Cancer Care and the Role of Social Capital in Obtaining Cancer Resources* (First edition).

Cordova, J., Andrykowski, M., Kenady, M., Daniel, E., McGrath, C., Sloan, P., & Redd, H. (1995). Frequency and correlates of posttraumatic-stress-disorder-like symptoms after treatment for breast cancer. *Journal of Consulting and Clinical Psychology*, *63*(6), 981–986.

Cozby, P. C. (2001). *Methods in Behavioral Research* (7th ed.). California: Mayfield Publishing Company.

Dan, J. S., Friedman, M., & Blanco, C. (2011). *Post-trumatic stress disorder* (First edit). Retrieved from https://books.google.ps/books?id=BptFaTiO5M4C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Darshit, P., Paolo, D. I., Gail, G., Thanuja, T., Ramya, Ramamoorthi, Michael, P., & Jayaraj, R. (2015). Post-traumatic stress disorder and post-traumatic growth in breast cancer patients - a systematic review. *Asian Pacific Journal of Cancer Prevention*, *16*(2), 641–646. http://doi.org/DOI:http://dx.doi.org/10.7314/APJCP.2015.16.2.641

De Moor, J. S., Mariotto, A. B., Parry, C., Alfano, C. M., Padgett, L., Kent, E., & Rowland, J. H. (2013). Cancer survivors in the United States: Prevalence across the survivorship trajectory and implications for care. *Cancer Epidemiology, Biomarkers & Prevention*, *22*, 561–570. http://doi.org/http:// dx.doi.org/10.1158/1055-9965.EPI-12-1356

DeKeyser Ganz, F., Raz, H., Gothelf, D., Yaniv, I., & Buchval, I. (2010). Post-traumatic stress disorder in Israeli survivors of childhood cancer. *Oncol Nurs Forum*, *37*(2), 160–167. http://doi.org/0251270483M13Q57 [pii]\r10.1188/10.ONF.160-167

Demirci, S., Eser, E., Ozsaran, Z., Tankisi, D., Aras, A. B., Ozaydemir, G., & Anacak, Y. (2011). Validation of the Turkish versions of EORTC QLQ-C30 and BR23 modules in breast cancer patients. *Asian Pacific Journal of Cancer Prevention*, *12*(5), 1283–1287.

Desai, K., Mao, J., Su, I., DeMichele, A., Li, Q., Xie, S., & Gehrma, P. (2013). Prevalence and risk factors for insomnia among breast cancer patients on aromatase inhibitors. *Supportive Care in*

Cancer, *21*(1), 43–51.

Detre, J. A., Leigh, J. S., Williams, D. S., & Koretsky, A. P. (1992). Perfusion imaging. *Magnetic Resonance in Medicine*, *23*(1), 37–45.

Ebrahimi, M., Vahdaninia, M., & Montazeri, A. (2002). Risk factors for breast cancer in Iran: a case-control study. *Breast Cancer Research*, *4*(10). http://doi.org/DOI: 10.1186/bcr454

Efficace, F., Biganzoli, L., Piccart, M., Coens, C., Van Steen, K., Cufer, T., … Twelves, C. (2004). Baseline health-related quality-of-life data as prognostic factors in a phase III multicentre study of women with metastatic breast cancer. *European Journal of Cancer*, *40*(7), 1021–1030.

El Saghir, N. S., Khalil, M. K., Eid, T., El Kinge, A. R., Charafeddine, M., Geara, F., … Shamseddine, A. I. (2007). Trends in epidemiology and management of breast cancer in developing Arab countries: A literature and registry analysis. *International Journal of Surgery*, *5*(4), 225–233. http://doi.org/10.1016/j.ijsu.2006.06.015

Engel, J., Kerr, J., Schlesinger-Raab, A., Eckel, R., Sauer, H., & Hölzel, D. (2003). Predictors of quality of life of breast cancer patients. *Acta Oncologica (Stockholm, Sweden)*, *42*(7), 710–718. http://doi.org/10.1080/02841860310017658

EORTC. (2001). *The European Organisation for Research and Treatment of cancer, EORTC QLQ-C30 Scoring Manual The EORTC QLQ-C30* (Vol. 30).

Faller, H., Schuler, M., Richard, M., Heckl, U., Weis, J., & Küffner, R. (2013). Effects of psycho-oncologic interventions on emotional distress and quality of life in adult patients with cancer: systematic review and meta-analysis. *Journal of Clinical Oncology*. http://doi.org/10.1200/JCO.2011.40.8922

Fayers, P. (2001). Interpreting quality of life data: population- based reference data for the EORTC QLQ – C30. Eur J Cancer 2001, 37: *EUROPEAN JOURNAL OF Cancer*, *37*, 1331–1334. http://doi.org/http://dx.doi.org/10.1016/S0959-8049(01)00127-7

Ferlay, J., Soerjomataram, I., Ervik, M., Dikshit, R., S, E., & C, M. (2013). *Cancer incidence and mortality worldwide*. France.

Ferrans, C. E., & Powers, M. J. (1995). Quality of life index: development and psychometric properties. *Annals of Nursing Science*, *8*, 15–24.

Ferrell, B. R. (1996). The quality of lives: 1,525 voices of cancer. In *Oncology nursing forum* (Vol. 23, p. 909).

Ferrell, B. R., Dow, K. H., Curbow, B., & Gotay, C. C. (1997). Quality of life among long-term cancer survivors. *Oncology*, *11*(4).

Ferrell, B. R., Dow, K. H., & Grant, M. (1995). Measurement of the quality of life in cancer survivors. *Quality of Life Research*, *4*(6), 523–531.

Fiorentino, L., & Ancoli, I. S. (2006). Insomnia and its treatment in women with breast cancer. *Sleep Medicine Reviews*, *10*(6), 419–429. http://doi.org/10.1016/j.smrv.2006.03.005

Freedman, A., Slattery, M., Ballard-Barbash, R., Willis, G., Cann, B., Pee, D., Pfeiffer, R. (2009). Colorectal cancer risk prediction tool for white men and women without known susceptibility. *Clinical Oncology*, *27*(5), 686–693. http://doi.org/doi: 10.1200/JCO

Frenk, J. (2009). Cancer is on the rise in developing countries. *Harvard University Jornal*, *2*.

Gates, R. A., & Fink, R. M. (2008). *Oncology Nursing Secrets* (Third edit). Elsevier. Retrieved from https://books.google.ps/books?id=ZAeLUdYOq64C&pg=PA402&dq=fatigue+oncology+nursing+society&hl=en&sa=X&ved=0ahUKEwjC4bv_yJ3NAhVJvhQKHSMtB6gQ6AEIKTAB#v=onepage&q=fatigue oncology nursing society&f=false

Golden-Kreutz, D., Thornton, L., Wells-Di Gregorio, S., Frierson, G., Jim, H., Carpenter, K., … Andersen, B. (2005). Traumatic stress, perceived global stress, and life events: prospectively predicting quality of life in breast cancer patients. *Health Psychology*, *24*(3), 288.

Gong, T., Wu, Q., Vogtmann, E., Lin, B., & Wang, Y. (2013). Age at menarche and risk of ovarian cancer: a meta-analysis of epidemiological studies. *International Jurnal of Cancer*, *132*(12), 2894–2900. http://doi.org/doi: 10.1002/ijc.27952

Goodwin, P. J., Leszcz, M., Ennis, M., Koopmans, J., Vincent, L., Guther, H., … Navarro, M. (2001). The effect of group psychosocial support on survival in metastatic breast cancer. *New England Journal of Medicine*, *345*(24), 1719–1726.

Goudas, L. C., Bloch, R., Gialeli-Goudas, M., Lau, J., & Carr, D. B. (2005). The epidemiology of cancer pain. *Cancer Investigation*, *23*(2), 182–190.

Green, B., Krupnick, L., Rowland, H., Epstein, A., Stockton, P., Spertus, I., & Stern, N. (2000). No Title. *Journal of Clinical Oncology*, *18*, 1084–1093.

Guggenheim, D. E., & Shah, M. A. (2013). Gastric cancer epidemiology and risk factors†. *Surgical Oncology*, *107*(3), 230–236. http://doi.org/10.1002/jso.23262

Güner, P., Vedat, I., Kömürcü, S., Il, S., Öztürk, B., Arpaci, F., & Özet, A. (2006). Quality of life and sociodemographic characteristics of patients with cancer in Turkey. *Oncology Nursing Forum*, *33*(6), 2006.

Gurevich, M., Devins, G. M., & Rodin, G. M. (2002). Stress response syndromes and cancer: conceptual and assessment issues. *Psychosomatics*, *43*, 259–281.

http://doi.org/doi:10.1176/appi.psy.43.4.259

Guyatt, G. H., Feeny, D. H., & Patrick, D. L. (1993). Measuring health-related quality of life. *Annals of Internal Medicine*, *118*(8), 622–629.

Hahn, E. E., Hays, R. D., Kahn, K. L., Litwin, M. S., Patricia, A., Angeles, L., … Angeles, L. (2015). Post-traumatic stress symptoms in cancer survivors: relationship to the impact of cancer scale and other associated risk factors. *Psychooncology*, *24*(6), 643–652. http://doi.org/10.1002/pon.3623.Post-traumatic

Hartge, P., Wang, S. S., Bracci, P. M., Devesa, S. S., Holly, E. A., & Schottenfeld D, F. J. (2006). *Cancer Epidemiology and Prevention* (Third Edit). New York: Oxford University Press .

Härtl, K., Janni, W., Kästner, R., Sommer, H., Strobl, B., Rack, B., & Stauber, M. (2003). Original article Impact of medical and demographic factors on long-term quality of life and body image of breast cancer patients, 1064–1071. http://doi.org/10.1093/annonc/mdg289

Hermelink, K., Hermelink, K., Voigt, V., Kaste, J., Neufeld, F., Wuerstlein, R., … Harbeck, N. (2015). Elucidating pretreatment cognitive impairment in breast cancer patients : the impact of cancer-related post-traumatic stress elucidating pretreatment cognitive impairment in breast cancer patients : the impact of cancer-related post-traumatic stress. *Journal of the National Cancer Institute*, *107*(7). http://doi.org/10.1093/jnci/djv099

Hewitt, M., Rowland, J. H., & Yancik, R. (2003). Cancer survivors in the United States: age, health, and disability. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, *58*(1), M82–M91.

Heydarnejad, M., Hassanpour, D. A., & Solati K, D. (2011). Factors affecting quality of life in cancer patients undergoing chemotherapy, *11*(2).

Hussain, S., Altieri, A., Sundquist, J., & Hemminki, K. (2008). Influence of education level on breast cancer risk and survival in Sweden between 1990 and 2004. *Intermational Jurnal of Cancer*, *122*(1), 165–9.

Jacobsen, P. B., & Andrykowski, M. A. (2015). Tertiary prevention in cancer care: Understanding and addressing the psychological dimensions of cancer during the active treatment period. *American Psychologist*, *70*, 134–145. http://doi.org/http://dx.doi.org/10.1037/a0036513

Jemal, A., Bray, F., Center, M., Ferlay, J., Ward, E., & Forman, D. (2011). Global cancer statistics. *CA Cancer J Clin*, *61*, 237–247.

Jones, R. (2001). Depression and anxiety in oncology, the oncologist's perspective. *Journal of Clinical Psychiatry*, *62*, 52–55.

Khleif, M. H., & Imam, A. M. (2013). Quality of life for Palestinian patients with cancer in the

absence of a palliative-care service: a triangulated study. *The Lancet*, *382*, S23. http://doi.org/10.1016/S0140-6736(13)62595-7

Kogevinas, Pearce, N., Susser, M., & Bo§etta, P. (1997). Social inequalities and cancer. *International Agency for Research on Cancer*, *138*.

Kootstra, J., Hoekstra-Weebers, JE, Rietman, H., & Al, E. (2008). Quality of life after sentinel lymph node biopsy or axillary lymph node dissection in stage I/II breast cancer patients: a prospective longitudinal study. *Annals Surgical Oncology*, *15*, 2533– 2541.

Kroenke, C. H., Rosner, B., Chen, W. Y., Kawachi, I., Colditz, G. A., & Holmes, M. D. (2004). Functional impact of breast cancer by age at diagnosis. *Journal of Clinical Oncology*, *22*(10), 1849–1856. http://doi.org/10.1200/JCO.2004.04.173

Kryger, M. (2004). *A women's guide to sleep disorders.* New York: McGraw-Hill.

Kwakkenbos, L., Coyne, J., & Thombs, B. (2014). Prevalence of posttraumatic stress disorder (PTSD) in women with breast cancer. *J Psychosom Res 2014*, *76*, 485–488.

Leonard, B. (1993). *Leukemia: A Research Repor*. USA.

Leplège, A., & Hunt, S. (1997). The problem of quality of life in medicine. *JAMA*, *2*, 47–50.

Leuven, E., Plug, E., & Rønning, M. (2014). *Education and cancer risk*. Amsterdam,Norway.

Levine, E., Eckhardt, J., & Targ, E. (2005). Change in post-traumatic stress symptoms following psychosocial treatment for breast cancer. *Psychooncology*, *14*, 618–635.

Lu, W., Cui, Y., Chen, X., Zheng, Y., Gu, K., Cai, H., … Shu, X.-O. (2009). Changes in quality of life among breast cancer patients three years post-diagnosis. *Breast Cancer Research and Treatment*, *114*(2), 357–369.

Lutgendorf, S., Geest, K. De, Bender, D., Ahmed, A., Goodheart, Michael, J., … Cole, K. (2012). Social influences on clinical outcomes of patients with ovarian cancer. *Clinical Oncology*, *30*(23), 2885–2890. http://doi.org/doi:10.1200/JCO.2011.39.4411

Lynch, J. W., Smith, G. D., Kaplan, G. A., & House, J. S. (2000). Income inequality and mortality: importance to health of individual income, psychosocial environment, or material conditions. *British Medical Journal*, *320*(7243), 1200.

Mandelblatt, J. S., Stern, R. A., Luta, G., McGuckin, M., Clapp, J. D., Hurria, A., & Gavett, B. (2014). Cognitive impairment in older patients with breast cancer before systemic therapy: is there an interaction between cancer and comorbidity?. Journal of Clinical Oncology, JCO-2013. *Clinical Oncology*. http://doi.org/doi: 10.1200/JCO.2013.54.2050

Martínez, M. E., Anderson, K., Murphy, J. D., Hurley, S., Canchola, A. J., Keegan, T. H. M., …

Gomez, S. L. (2016). Differences in marital status and mortality by race/ethnicity and nativity among California cancer patients. *Cancer Journal*, *122*(10), 1570–1578. http://doi.org/10.1002/cncr.29886

McHorney, C. (1999). Health status assessment methods for adults: past accomplishments and future challenges. *Annual Rev Public Health, 20*(1), 309–35.

Mehnert, A., & Koch, U. (2007). Prevalence of acute and post-traumatic stress disorder and comorbid mental disorders in breast cancer patients during primary cancer care: a prospective study. *Psycho-Oncology*, *16*(3), 181–188.

Mehnert, A., & Koch, U. (2008). Psychological comorbidity and health-related quality of life and its association with awareness , utilization , and need for psychosocial support in a cancer register-based sample of long-term breast cancer survivors, *64*, 383–391. http://doi.org/10.1016/j.jpsychores.2007.12.005

Melnychuk, M. (2009). Socioeconomic status and breast cancer risk : a new methodology to estimate the association, 1–30.

Mitchell, M. L., & Jolley, J. M. (2012). *Research Design Explained* (Eight edition). Cengage learning.

Montazeri, A. (2008). Health-related quality of life in breast cancer patients: A bibliographic review of the literature from 1974 to 2007. *Journal of Experimental & Clinical Cancer Research*, *27*(32). http://doi.org/10.1186/1756-9966-27-32

Montazeri, A. (2009). Quality of life data as prognostic indicators of survival in cancer patients: an overview of the literature from 1982 to 2008. *Health and Quality of Life Outcomes*, *7*(1), 1.

Montazeri, A., Vahdaninia, M., Harirchi, I., Ebrahimi, M., Khaleghi, F., & Jarvandi, S. (2008). Quality of life in patients with breast cancer before and after diagnosis: an eighteen months follow-up study. *BioMed*, *8*, 330–336. http://doi.org/10.1186/1471-2407-8-330

Mulligan, E., Wachen, J. S., Naik, A. D., Jeffrey, G., & Moye, J. (2014). Cancer as a criterion a traumatic stressor for veterans: Prevalence and correlates. *Psychological Trauma: Theory, Research, Practice, and Policy*, *6*(1), S73–S81.

NCI. (2009). National Cancer Institute. Cancer-Related Post-traumatic Stress. Retrieved May 20, 2006, from http://www.cancer.gov/about-cancer/coping/survivorship/new-normal/ptsd. Accessed on June, 2014

NCI. (2015a). National Cancer Institute. Cancer. Retrieved May 20, 2003, from http://www.cancer.gov/about-cancer

NCI. (2015b). National Cancer Institute. Cancer-Related Post-traumatic Stress. Retrieved May 20,

2003, from http://www.cancer.gov/about-cancer/coping/survivorship/new-normal/ptsd-pdq

NCI, N. C. I. (2015c). Adjustment to Cancer: Anxiety and Distress–for health professionals (PDQ®).

Nee, P. W. (2013). *The Key Facts on Cancer Risk Factors and Causes* (Third edit). USA: MedicalCenter.

Network, N. C. C. (2014). Clinical practice guidelines in oncology: breast cancer, Version 2.2011.

Nevid, J. S. (2012). *Essentials of Psychology: Concepts and Applications* (Fourth edi).

Nissan, A., Spira, R. M., Hamburger, T., Badrriyah, M., Prus, D., Cohen, T., … Peretz, T. (2004). Clinical profile of breast cancer in Arab and Jewish women in the Jerusalem area. *American Journal of Surgery*, *188*(1), 62–67. http://doi.org/10.1016/j.amjsurg.2003.11.039

Northouse, L. (1994). The impact of cancer in women on the family. *Cancer Practice*, *3*(3), 134–142.

O'Connor, M., Christensen, S., Jensen, A., Møller, S., & Zachariae, R. (2011). How traumatic is breast cancer ? Post-traumatic stress symptoms (PTSS) and risk factors for severe PTSS at 3 and 15 months after surgery in a nationwide cohort of Danish women treated for primary breast cancer. *British Journal of Cancer*, *31*, 419–426. http://doi.org/10.1038/sj.bjc.6606073

O'Connor, R. (2007). Measuring Quality of Life in health–let's do it! *Australian Journal of Physiotherapy*, *53*.

Odeh, M. (2011). *Epidemiological indicators in Palestinian cohort women affected with Breast Cancer*.

Osborne, C., Ostir, G., Du, X., Peek, M., & Goodwin, J. (2005). The influence of marital status on the stage at diagnosis, treatment, and survival of older women with breast cancer. *Breast Cancer Research*, *93*(1), 41–47.

Parkin, D. (1998). The global burden of cancer. *Semin Cancer Biol*, *8*(4), 219–253.

PCBS. (2004). *Palestinian Central Berue of statistics. Psychosocial health survey for children 5-17 years.* Ramallah-Palestine.

PCBS. (2008). Palestinian Central Berue of statistics. A press release on world refugee day : the demographic characteristics of the Palestinian.

PCBS. (2012). *Palestinian Central Berue of statistics. Glossary of Statistical Terms Used in PCBS. Palestinian National Authority.* Ramallah-Palestine. Retrieved from http://www.pcbs.gov.ps/Portals/_PCBS/Downloads/book1863.pdf.

PCBS. (2015a). *Palestinian Central Berue of statistics. On the Eve of the international population*

Day 11/7/2015.

PCBS. (2015b). *Palestinian Central Berue of statistics. Press release on the Eve of international population*.

Perez, S., Andreu, Y., Garrido, M. J., Ibnanz, E., Dura, E., Conchado, A., & Etzel, C. (2014). Posttraumatic stress symptoms in breast cancer patients : temporal evolution , predictors , and mediation posttraumatic stress symptoms in breast cancer patients. *Journal of Trumatic Stress*. http://doi.org/10.1002/jts.21901

Phillips, K.-A., & Bernhard, J. (2003). Adjuvant breast cancer treatment and cognitive function: current knowledge and research directions. *Journal of the National Cancer Institute*, *95*(3), 190–197. http://doi.org/10.1093/jnci/95.3.190

Pinar, R. U. K. Y. E., Salepc, T., & Affiar, F. (2003). Assessment of quality of life in Turkish patients with cancer. *Turkish Journal of Cancer*, *33*(2), 96–101.

PMoH. (2013). *Palestinian Ministry of Health. Annual Report*.

PMoH. (2014). *Palestinian Ministry of Health. Annual Report*.

PMoH. (2016). *Palestinian Ministry of Health. Beit-Jala hospital report*. Bethlehem.

Polgar, S. T. S. (1997). *Introduction to research in the health sciences* (fifth).

Polit, D. F., & Beck, C. T. (2004). *Nursing research: principles and methods*. Seventh edition. Lippincott Williams & Wilkins.

Preston John, W., & Terence Martin, K. (Eds.). (2004). *Assessing Psychological Trauma and PTSD* (Second). New York.

Pud, D. (2011). Gender differences in predicting quality of life in cancer patients with pain. *European Journal of Oncology Nursing : The Official Journal of European Oncology Nursing Society*, *15*(5), 486–91. Retrieved from doritpud@research.haifa.ac.il

Pud, D. (2011). Gender differences in predicting quality of life in cancer patients with pain. *European Journal of Oncology Nursing : The Official Journal of European Oncology Nursing Society*, *15*(5), 486–491. http://doi.org/10.1016/j.ejon.2010.12.005

Quinn, G. P., Gonçalves, V., Sehovic, I., Bowman, M. L., & Reed, D. R. (2015). Quality of life in adolescent and young adult cancer patients: a systematic review of the literature. *Patient related outcome measures*, *6*, 19–51. http://doi.org/10.2147/PROM.S51658

Rebora, P., Czene, K., & Reilly, M. (2008). Timing of familial breast cancer in sisters. *National Cancer Institue Jornal*, *100*(10), 721–727. http://doi.org/doi: 10.1093/jnci/djn146

Rizalar, S., Ozbas, A., Akyolcu, N., & Gungor, B. (2014). Effect of perceived social support on

psychosocial adjustment of Turkish patients with breast cancer. *Asian Pacific Journal of Cancer Prevention : APJCP*, *15*(8), 3429–3434.

Robert, G., Laforge,S., Joseph, R., James, O., Prochaska, A., & McHorney, A. (1999). Stage of regular exercise and health- related quality of life. http://doi.org/10.1006/pmed.1998.0429

Robert, S. A., IndianaS., Trenthamb, A. D., Hampton, J. M., McElroy, J. A., Polly, A. N., & Remingtom, P. L. (2004). Socioeconomic risk factors for breast cancer distinguishing individual and community-level effects. *Epidemiology*, *15*(4), 442–450.

Rowan, B. G., Gimble, J. M., Sheng, M., Anbalagan, M., Jones, R. K., Frazier, T. P., … Kutner, R. (2014). Human adipose tissue-derived stromal/stem cells promote migration and early metastasis of triple negative breast cancer xenografts. *PloS One*, *9*(2), e89595.

Rubin, A., & Bobbie, E. (2010). *Research methods for social work* (Seventh ed). Beltmont, USA: Nelson Education.

Samara, A. M., & Saca, H. H. (2009). Factors Influencing Quality of Life for Women with Breast Cancer in Palestine, 63.

Schrader, K., Hurlburt, J., Kalloger, S., Hansford, S., Young, S., Huntsman, D., … McAlpine, J. (2012). Germline BRCA1 and BRCA2 mutations in ovarian cancer: utility of a histology-based referral strategy. *Obtetric Gnecology*, *120*(2), 235–240. http://doi.org/doi: 10.1097/AOG.0b013e31825f3576

Seliger, H. W., Shohamy, E., & Shohamy, E. G. (1989). *Second language research methods*. Oxford University Press.

Shoemaker, L., Estfan, B., Induru, R., & Walsh, T. (2011). Symptom management: an important part of cancer care. *Cleve Clin J Med.*, *78*, 25–34.

Smyth, R. (2004). Exploring the usefulness of a conceptual framework as a research tool: a research's reflections. *The Educational Research*, *14*(2), 167–180.

Stanton, A. L., Rowland, J. H., & Ganz, P. A. (2015). Life after diagnosis and treatment of cancer in adulthood: Contributions from psychosocial oncology research. *American Psychologist*, *70*(2), 159–174. http://doi.org/http://dx.doi.org.cat1.lib.trentu.ca:8080/10.1037/a0037875

Stephen, B. H., Steven, R. C., Warren, B., Thomas, N. B., & Deborah, G. G. (2011). *Designing Clinical Research* (Third Edit). Lippincott Williams & Wilkins.

Stephenson, J., & Davies, A. (2006). An assessment of aetiology-based guidelines for the management of nausea and vomiting in patients with advanced cancer. *Support Care Cancer.*, *14*(4), 348–353.

Stevens, G. (2009). Global Health Risks: Mortality and burden of disease attributable to selected

major risks. *Bulletin of the World Health Organization*, *87*, 646–646. http://doi.org/10.2471/BLT.09.070565

Stewart, B. W., & Wild, C. P. (2014). *World cancer report 2014*. The International Agency for Cancer Research. WHO, World Health Organizatiion.

Stewart, B. W. & Wild, C. P. (2014). *World cancer report 2014*.

Tarakeshwar, N., Vanderwerker, L., Paulk, E., Pearce, M., Kasl, S., & Prigerson, H. (2006). Religious coping is associated with the quality of life of patients with advanced cancer. *Journal of Palliative Medicine*, *9*, 646–457.

Tavani, A., Fioretti, F., Franceschi, S., Gallus, S., Negri, E., Montella, M., … and La Vecchia, C. (1999). Education, socioeconomic status and risk of cancer of the colon and rectum. *International Journal of Epidemiology*, *28*(3), 380–385.

Tedstonea, J. E., & Tarrier, N. (2003). Posttraumatic stress disorder following medical illness and treatment. *Clinical Psychology Review*, *23*(3).

Thienthong, S., Pratheepawanit, N., Limwattananon, C., Maoleekoonpairoj, S., Lertsanguansinchai, P., & Chanvej, L. (2006). Pain and quality of life of cancer patients: a multi-center study in Thailand. *J Med Assoc Thai*, *89*(8), 1120–1126.

Üstündag, S., & Zencirci, A. D. (2015). Factors affecting the quality of life of cancer patients undergoing chemotherapy: A questionnaire study. *Oncol Ogy Nursing Journal*, *2*(1), 17–25. http://doi.org/DOI: 10.4103/2347-5625.152402

Valenti, M., Porzio, G., Aielli, F., Verna, L., Cannita, K., Manno, R., … Ficorella, C. (2008). Physical exercise and quality of life in breast cancer survivors. *Int J Med Sci*, *5*(1), 24–28.

Van der, M. B. (2009). Relating information-needs to the cancer experience. *European Journal of Cancer*, *9*, 41–47.

Walker, B. R., Colledge, N. R., & Ralston, S. H. (2010). *Davidson's Priciple and Practice of Medicine* (21st ed.).

Walshe, W. H. (1846). *The Nature and Treatment of Cancer*. London.

Watson, P., Mcfall, M., Network, N., Illness, M., Mcbrine, C., & Service, P. (2012). *Best Practice Manual for Posttraumatic Stress Disorder (PTSD) Compensation and Pension Examinations*.

Weathers, F. W., Huska, J. A., & Keane, T. M. (1991). The PTSD Checklist—Civilian version (PCL-C) available from FW Weathers National Center for PTSD, Boston Veterans Affairs Medical Center 150 S. *West, M., Livesley, WJ, Reiffer, L., & Sheldon, A.(1986). The Place of Attachment in the Life Events Model of Stress and Illness. Canadian Journal of Psychiatry*,

31, 202207.

WHO. (1997a). World Health Organisation. WHOQOL-Measuring quality of life. Retrieved April 20, 2003, from https://books.google.ps/books?id=Lm_4tgAACAAJ&dq=WHOQOL-Measuring+quality+of+life&hl=en&sa=X&ved=0ahUKEwj6nvi8y53NAhWBrRQKHT7JCYAQ6AEIGzAA

WHO. (2010). World Health Organisation. Urbanization and health. *Bulletin of the World Health Organization*, *88*, 241–320.

WHO. (2012). World Health Organisation. Globocan 2012: Estimated Cancer Incidence, Mortality and Prevalence Worldwide in 2012.

WHO. (2014a). Global status report on noncommunicable diseases 2014. *World Health*, 176. http://doi.org/ISBN 9789241564854

WHO. (2014b). *World Health Organisation. Global health status on noncommunicable diseases*.

WHO. (2016). World Health Organisation. Palliative care is an essential part of cancer control. Retrieved June 20, 2004, from http://www.who.int/cancer/palliative/en/

WHO, (1997b).World Health Organisation. WHOQOL-measuring quality of life.

Youlden, D., Cramb, S., Dunn, N., Muller, J., Pyke, C., & Baade, P. (2012). The descriptive epidemiology of female breast cancer: an international comparison of screening, incidence, survival and mortality. *Cancer Epidemiology: Principles and Methods*, *36*, 237–248.

Youlden, D. R., Cramb, S. M., Har Yip, C., & D., B. P. (2014). Incidence and mortality of female breast cancer in the Asia-Pacific region. *Cancer Biology & Medicine*, *11*(2), 101–115. http://doi.org/10.7497/j.issn.2095-3941.2014.02.005

Appendix I

الاستبانة

البيانات الديموغرافية الإحصائية :

1) العمر : .....

2) الحالة الاجتماعية :

I. عزباء
II. متزوجة
III. مطلقة
IV. أرملة
V. منفصلة
VI. مخطوبة

3) التعليم :

I. أمي
II. ابتدائي
III. ثانوي
IV. جامعي

4) السكن :

I. مدينة
II. قرية
III. مخيم
IV. اسم المحافظة : .....

5) الدخل الشهري

I. اقل من 2000
II. من 2000 الى 4000
III. اكثر من 4000

6) نوع السرطان الذي تم تشخيصه :
.....

7) مدة تشخيص السرطان : .....

8) نوع العلاج (يمكن اختيار اكثر من خيار) :

I. كيماوي
II. اشعاعي
III. جراحي
IV. علاجات شعبية
V.

9) قبل المرض ، هل تلقيت علاج نفسي :

I. نعم ب- لا

10) اذا كانت الاجابة (نعم) على سؤال 13 ما هي المشكلة النفسية التي كانت لديك.....

11) بعد الاصابة بالسرطان ، هل أخذت علاج نفسي :

I. نعم ب- لا

12) اذا كانت الاجابة (نعم) على سؤال 15 ما هي المشكلة النفسية التي كانت لديك.....

13) اذا كانت الاجابة نعم على سؤال 15 ما هو العلاج النفسي الذي اخذتيه

I. جلسات نفسية
II. علاج دوائي
III. غير ذلك، اذكريه .....

14) هل فكرت بإيذاء نفسك بعد تشخيصك بمرض السرطان

I. نعم
II. لا

15) اذا كانت الاجابة على سؤال 18 (نعم) كم مرة حاولت القيام بذلك .....

Arabic عربي

EORTC QLQ-C30 (Version 3)

نحن مهتمون بمعرفة بعض المعلومات عنك و عن صحتك. الرجاء الإجابة بنفسك عن كل من الأسئلة التالية و ذلك بوضع دائرة حول الإجابة الأكثر ملائمة لك. لا يوجد جواب "صحيح" أو "خطأ". جميع المعلومات ستعامل بسرية تامة.

الرجاء إدخال الحروف الأولى من اسمك: |_|_|_|_|

تاريخ ميلادك (اليوم، الشهر، السنة): |_|_| |_|_| |_|_|_|_|

تاريخ اليوم (اليوم، الشهر، السنة): 31 |_|_| |_|_| |_|_|_|_|

		إطلاقاً	قليلا	بما فيه الكفاية	كثيرا جدا
1.	هل لديك صعوبة في بذل مجهود جسدي شاق (متعب) مثل حمل كيس مشتريات ثقيل أو حقيبة؟	1	2	3	4
2.	هل لديك صعوبة بالمشي لمسافة طويلة؟	1	2	3	4
3.	هل لديك صعوبة بالمشي لمسافة قصيرة خارج البيت؟	1	2	3	4
4.	هل تحتاج للبقاء في السرير أو الكرسي خلال اليوم؟	1	2	3	4
5.	هل تحتاج للمساعدة في الأكل، ارتداء الملابس، الاغتسال أو استخدام المرحاض؟	1	2	3	4

خلال الأسبوع الماضي:

6.	هل كنت محدود/ مقيد عند القيام بعملك أو نشاطات يومية أخرى؟	1	2	3	4
7.	هل كنت محدود/ مقيد في ممارسة هواياتك او نشاطات في اوقات الفراغ؟	1	2	3	4
8.	هل شعرت بضيق بالنفس؟	1	2	3	4
9.	هل شعرت بأي ألم؟	1	2	3	4
10.	هل كنت بحاجة للراحة؟	1	2	3	4
11.	هل عانيت من مشاكل في النوم (أرق/ صعوبة في النوم/ نوم متقطع)؟	1	2	3	4
12.	هل شعرت بالضعف؟	1	2	3	4
13.	هل فقدت شهيتك للطعام (القدرة على الاكل)؟	1	2	3	4
14.	هل شعرت بالغثيان (اللعيان)؟	1	2	3	4
15.	هل تقيأت؟	1	2	3	4
16.	هل عانيت من إمساك؟	1	2	3	4

انتقل إلى الصفحة التالية من فضلك

خلال الأسبوع الماضي:	إطلاقاً	قليلا	بما فيه الكفاية	كثيرا جدا
17. هل كان لديك إسهال؟	1	2	3	4
18. هل كنت متعب؟	1	2	3	4
19. هل عانيت من ألم اثر سلبياً على نشاطاتك اليومية؟	1	2	3	4
20. هل كان لديك صعوبة بالتركيز في بعض الأمور مثل قراءة الجريدة أو مشاهدة التلفاز؟	1	2	3	4
21. هل شعرت بالتوتر؟	1	2	3	4
22. هل شعرت بالقلق؟	1	2	3	4
23. هل شعرت بالإنزعاج؟	1	2	3	4
24. هل شعرت بِاكتئاب ؟	1	2	3	4
25. هل كانت لديك صعوبة بتذكر الأشياء؟	1	2	3	4
26. هل حالتك الجسدية أو علاجك الطبي أثر سلبياً على حياتك العائلية؟	1	2	3	4
27. هل حالتك الجسدية أو علاجك الطبي أثر سلبياً على حياتك الاجتماعية؟	1	2	3	4
28. هل حالتك الجسدية أو علاجك الطبي أديا إلى مشاكل مالية؟	1	2	3	4

في الأسئلة التالية الرجاء الإشارة بدائرة حول الأرقام بين 1 - 7 الاكثر ملائمة لك

29. كيف تُقيّم صحتك عموما خلال الأسبوع الماضي؟

1	2	3	4	5	6	7
سيء جدا						ممتاز

30. كيف تُقيّم /جودة حياتك عموما/ مستوى حياتك عموماً خلال الأسبوع الماضي؟

1	2	3	4	5	6	7
سيء جدا						ممتاز

ENGLISH

EORTC QLQ-C30 (version 3)

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly confidential.

Please fill in your initials: ⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Your birthdate (Day, Month, Year): ⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋

Today's date (Day, Month, Year): 31 ⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋⌊_⌋

		Not at All	A Little	Quite a Bit	Very Much
1.	Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?	1	2	3	4
2.	Do you have any trouble taking a long walk?	1	2	3	4
3.	Do you have any trouble taking a short walk outside of the house?	1	2	3	4
4.	Do you need to stay in bed or a chair during the day?	1	2	3	4
5.	Do you need help with eating, dressing, washing yourself or using the toilet?	1	2	3	4

During the past week:

		Not at All	A Little	Quite a Bit	Very Much
6.	Were you limited in doing either your work or other daily activities?	1	2	3	4
7.	Were you limited in pursuing your hobbies or other leisure time activities?	1	2	3	4
8.	Were you short of breath?	1	2	3	4
9.	Have you had pain?	1	2	3	4
10.	Did you need to rest?	1	2	3	4
11.	Have you had trouble sleeping?	1	2	3	4
12.	Have you felt weak?	1	2	3	4
13.	Have you lacked appetite?	1	2	3	4
14.	Have you felt nauseated?	1	2	3	4
15.	Have you vomited?	1	2	3	4
16.	Have you been constipated?	1	2	3	4

Please go on to the next page

ENGLISH

During the past week:	**Not at All**	**A Little**	**Quite a Bit**	**Very Much**
17. Have you had diarrhea?	1	2	3	4
18. Were you tired?	1	2	3	4
19. Did pain interfere with your daily activities?	1	2	3	4
20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?	1	2	3	4
21. Did you feel tense?	1	2	3	4
22. Did you worry?	1	2	3	4
23. Did you feel irritable?	1	2	3	4
24. Did you feel depressed?	1	2	3	4
25. Have you had difficulty remembering things?	1	2	3	4
26. Has your physical condition or medical treatment interfered with your family life?	1	2	3	4
27. Has your physical condition or medical treatment interfered with your social activities?	1	2	3	4
28. Has your physical condition or medical treatment caused you financial difficulties?	1	2	3	4

For the following questions please circle the number between 1 and 7 that best applies to you

29. How would you rate your overall health during the past week?

1	2	3	4	5	6	7
Very poor						Excellent

30. How would you rate your overall quality of life during the past week?

1	2	3	4	5	6	7
Very poor						Excellent

Appendix IV

مقياس PCL-S

ترجمة: فردوس عبد ربة و د. منى حميد / جامعة القدس

التجربة الصعبة في الاستبيان تعني **تشخيص مرض السرطان**

التعليمات

- هذه الاستمارة تحتوي على قائمة من المشاكل والشكاوي التي تظهر احيانا لدى الناس احيانا نتيجة تعرضهم لخبرات ضاغطة في حياتهم . أرجو منك أن تقرأي كل عبارة من خلال استخدام الأرقام التي على الجهة الشمال من الورقة الى أي مدى أزعجتك هذه التجارب خلال الأسبوع الماضي.

الرقم	المشكلة	أبدا لا	قليلا	متوسط	اكثر قليلا	بشكر كبير
1	تكرار ذكريات ، أفكار أو صور مزعجة تتعلق بإصابتك بالتجربة الصعبة " تشخيص مرض السرطان ".	1	2	3	4	5
2	تكرار ، أحلام مزعجة حول التجربة الصعبة " تشخيص مرض السرطان".	1	2	3	4	5
3	بشكل مفاجئ أتصرف أو اشعر وكأن اخباري بالحدث المزعج " تشخيص مصابة بالسرطان " يتكرر ثانية (وكأنني اعيش التجربة مجددا) .	1	2	3	4	5
4	الشعور بالانزعاج الشديد عندما يحدث ما يذكرني بالتجربة الصعبة " تشخيص مرض السرطان".	1	2	3	4	5
5	أعاني من ردة فعل جسمية مثل (اضطرابات في القلب ، صعوبات تنفس ، العرق) عندما يحدث ما يذكرني بالحدث المزعج "تشخيص مرض السرطان".	1	2	3	4	5
6	اتجنب التفكير أو التحدث حول التجربة الصعبة "تشخيص مرض السرطان" أو اتجنب المشاعر المرتبطة به .	1	2	3	4	5
7	أتجنب الأنشطة أو المواقف التي تذكرني بالتجربة الصعبة . "تشخيص مرض السرطان"	1	2	3	4	5
8	أجد صعوبة في تذكر أجزاء مهمة من التجربة الصعبة في الماضي "تشخيص مرض السرطان"	1	2	3	4	5
9	فقدت الاهتمام في المشاركة بالأنشطة التي كنت استمتع بها سابقا .	1	2	3	4	5
10	أشعر بوجود مسافة أو بعد بيني وبين الناس الاخرين .	1	2	3	4	5
11	أشعر بالتبلد العاطفي أو الشعور بعدم القدرة على أن احب المقربين مني .	1	2	3	4	5
12	أشعر انه لا يوجد مستقبل أو ان مستقبلي قد توقف .	1	2	3	4	5
13	أواجه صعوبات البدء بالنوم أو البقاء مستغرقا في النوم	1	2	3	4	5
14	الشعور بالانفعال (الهيجان) أو بنوبات غضب .	1	2	3	4	5
15	أواجه صعوبات في التركيز	1	2	3	4	5
16	أشعر بأني متيقظة أو انني في حالة ترقب .	1	2	3	4	5
17	أجفل بسهولة (أذهل بسهولة).	1	2	3	4	5

Appendix V

PTSD CheckList – Civilian Version (PCL-S)

Patient's Name: _____

Instructions: Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem *in the past month.*

The event you experienced was_____on_____(date)

No.	Response:	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1.	Repeated, disturbing *memories*, *thoughts*, or *images* of a stressful experience from the past?					
2.	Repeated, disturbing *dreams* of a stressful experience from the past?					
3.	Suddenly *acting* or *feeling* as if a stressful experience *were happening again* (as if you were reliving it)?					
4.	Feeling *very upset* when *something reminded* you of a stressful experience from the past?					
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful experience from the past?					
6.	Avoid *thinking about* or *talking about* a stressful experience from the past or avoid *having feelings* related to it?					
7.	Avoid *activities* or *situations* because *they remind you* of a stressful experience from the past?					
8.	Trouble *remembering important parts* of a stressful experience from the past?					
9.	Loss of interest in things that you used to enjoy?					
10.	Feeling *distant* or *cut off* from other people?					
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12.	Feeling as if your *future* will somehow be *cut short*?					
13.	Trouble falling or staying asleep?					
14.	Feeling irritable or having angry outbursts?					
15.	Having difficulty concentrating?					
16.	Being *"super alert"* or watchful on guard?					
17.	Feeling *jumpy* or easily startled?					

Weathers, F.W., Huska, J.A., Keane, T.M. *PCL-S for DSM-IV.* Boston: National Center for PTSD – Behavioral Science Division, 1991.

Appendix VI

Tukey Tests
Multiple Comparisons

Table (1) Tukey HSD test for age variable

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Sig.
Physical Function	20 - <40 years old	40- <50 years	4.58635	0.765
		50 - <60 years	17.62317(*)	0.001
		>=60	23.72897(*)	0.000
	40- <50 years	20 - <40 years old	-4.58635	0.765
		50 - <60 years	13.03682(*)	0.016
		>=60	19.14261(*)	0.000
	50 - <60 years	20 - <40 years old	-17.62317(*)	0.001
		40- <50 years	-13.03682(*)	0.016
		>=60	6.10579	0.456
	>=60	20 - <40 years old	-23.72897(*)	0.000
		40- <50 years	-19.14261(*)	0.000
		50 - <60 years	-6.10579	0.456
Role Function	20 - <40 years old	40- <50 years	-9.56770	0.374
		50 - <60 years	-0.77819	0.999
		>=60	9.58199	0.335
	40- <50 years	20 - <40 years old	9.56770	0.374
		50 - <60 years	8.78951	0.381
		>=60	19.14969(*)	0.002
	50 - <60 years	20 - <40 years old	0.77819	0.999
		40- <50 years	-8.78951	0.381
		>=60	10.36018	0.198
	>=60	20 - <40 years old	-9.58199	0.335
		40- <50 years	-19.14969(*)	0.002
		50 - <60 years	-10.36018	0.198
Social Functioning	20 - <40 years old	40- <50 years	-7.30744	0.396
		50 - <60 years	-11.65739	0.056
		>=60	-11.97637(*)	0.038
	40- <50 years	20 - <40 years old	7.30744	0.396
		50 - <60 years	-4.34995	0.743
		>=60	-4.66893	0.676
	50 - <60 years	20 - <40 years old	11.65739	0.056
		40- <50 years	4.34995	0.743
		>=60	-0.31898	1.000
	>=60	20 - <40 years old	11.97637(*)	0.038
		40- <50 years	4.66893	0.676
		50 - <60 years	0.31898	1.000

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Sig.
Emotional Functioning	20 - <40 years' old	40- <50 years	-9.82280	0.222
		50 - <60 years	-11.26056	0.118
		>=60	-13.15118(*)	0.039
	40- <50 years	20 - <40 years old	9.82280	0.222
		50 - <60 years	-1.43776	0.990
		>=60	-3.32838	0.886
	50 - <60 years	20 - <40 years old	11.26056	0.118
		40- <50 years	1.43776	0.990
		>=60	-1.89062	0.975
	>=60	20 - <40 years old	13.15118(*)	0.039
		40- <50 years	3.32838	0.886
		50 - <60 years	1.89062	0.975
Cognitive Functioning	20 - <40 years old	40- <50 years	4.72350	0.721
		50 - <60 years	13.20346(*)	0.017
		>=60	27.31830(*)	0.000
	40- <50 years	20 - <40 years old	-4.72350	0.721
		50 - <60 years	8.47996	0.178
		>=60	22.59479(*)	0.000
	50 - <60 years	20 - <40 years old	-13.20346(*)	0.017
		40- <50 years	-8.47996	0.178
		>=60	14.11483(*)	0.002
	>=60	20 - <40 years old	-27.31830(*)	0.000
		40- <50 years	-22.59479(*)	0.000
		50 - <60 years	-14.11483(*)	0.002
Pain	20 - <40 years old	40- <50 years	6.44064	0.556
		50 - <60 years	-0.40198	1.000
		>=60	-6.02399	0.577
	40- <50 years	20 - <40 years old	-6.44064	0.556
		50 - <60 years	-6.84262	0.435
		>=60	-12.46463(*)	0.025
	50 - <60 years	20 - <40 years old	0.40198	1.000
		40- <50 years	6.84262	0.435
		>=60	-5.62201	0.563
	>=60	20 - <40 years old	6.02399	0.577
		40- <50 years	12.46463(*)	0.025
		50 - <60 years	5.62201	0.563
Fatigue	20 - <40 years old	40- <50 years	4.44371	0.805
		50 - <60 years	-2.85508	0.936
		>=60	-10.13844	0.143
	40- <50 years	20 - <40 years old	-4.44371	0.805
		50 - <60 years	-7.29879	0.382
		>=60	-14.58215(*)	0.006
	50 - <60 years	20 - <40 years old	2.85508	0.936
		40- <50 years	7.29879	0.382
		>=60	-7.28336	0.339
	>=60	20 - <40 years old	10.13844	0.143
		40- <50 years	14.58215(*)	0.006
		50 - <60 years	7.28336	0.339

Dependent Variable	(I) Age	(J) Age	Mean Difference (I-J)	Sig.
Financial Impact	20 - <40 years old	40- <50 years	-2.45776	0.976
		50 - <60 years	-5.69986	0.768
		>=60	-13.40852	0.091
	40- <50 years	20 - <40 years old	2.45776	0.976
		50 - <60 years	-3.24210	0.936
		>=60	-10.95076	0.173
	50 - <60 years	20 - <40 years old	5.69986	0.768
		40- <50 years	3.24210	0.936
		>=60	-7.70867	0.459
	>=60	20 - <40 years old	13.40852	0.091
		40- <50 years	10.95076	0.173
		50 - <60 years	7.70867	0.459
Global Quality of Life	20 - <40 years old	40- <50 years	-7.14834	0.180
		50 - <60 years	-2.92465	0.835
		>=60	4.64778	0.515
	40- <50 years	20 - <40 years old	7.14834	0.180
		50 - <60 years	4.22369	0.567
		>=60	11.79612(*)	0.001
	50 - <60 years	20 - <40 years old	2.92465	0.835
		40- <50 years	-4.22369	0.567
		>=60	7.57243	0.072
	>=60	20 - <40 years old	-4.64778	0.515
		40- <50 years	-11.79612(*)	0.001
		50 - <60 years	-7.57243	0.072

*. The mean difference is significant at the .05 level.

Post Hoc Tests

Multiple Comparisons

Table (2) Tukey HSD test for marital staus variable

Dependent Variable	(I) Marital Status	(J) Marital Status	Mean Difference (I-J)	Sig.
Physical Function	Single	Married	1.83537	0.958
		Widow	14.37908	0.139
	Married	Single	-1.83537	0.958
		Widow	12.54371(*)	0.017
	Widow	Single	-14.37908	0.139
		Married	-12.54371(*)	0.017
Role Function	Single	Married	-19.55808(*)	0.036
		Widow	-6.66164	0.743
	Married	Single	19.55808(*)	0.036
		Widow	12.89644(*)	0.050
	Widow	Single	6.66164	0.743
		Married	-12.89644(*)	0.050
Social Functioning	Single	Married	-10.78929	0.193
		Widow	-11.86526	0.221
	Married	Single	10.78929	0.193
		Widow	-1.07597	0.966
	Widow	Single	11.86526	0.221
		Married	1.07597	0.966
Emotional Functioning	Single	Married	-1.15955	0.984
		Widow	-9.33886	0.459
	Married	Single	1.15955	0.984
		Widow	-8.17931	0.196
	Widow	Single	9.33886	0.459
		Married	8.17931	0.196
Cognitive Functioning	Single	Married	16.89061(*)	0.019
		Widow	34.11262(*)	0.000
	Married	Single	-16.89061(*)	0.019
		Widow	17.22201(*)	0.000
	Widow	Single	-34.11262(*)	0.000
		Married	-17.22201(*)	0.000
Pain	Single	Married	0.80123	0.992
		Widow	-2.46355	0.943
	Married	Single	-0.80123	0.992
		Widow	-3.26478	0.754
	Widow	Single	2.46355	0.943
		Married	3.26478	0.754
Fatigue	Single	Married	1.83471	0.959
		Widow	-5.76504	0.730
	Married	Single	-1.83471	0.959
		Widow	-7.59975	0.226
	Widow	Single	5.76504	0.730
		Married	7.59975	0.226

Dependent Variable	(I) Marital Status	(J) Marital Status	Mean Difference (I-J)	Sig.
Financial Impact	Single	Married	-13.88474	0.178
		Widow	-29.51232(*)	0.003
	Married	Single	13.88474	0.178
		Widow	-15.62758(*)	0.012
	Widow	Single	29.51232(*)	0.003
		Married	15.62758(*)	0.012
Global Quality of Life	Single	Married	-3.15268	0.785
		Widow	2.82805	0.863
	Married	Single	3.15268	0.785
		Widow	5.98074	0.167
	Widow	Single	-2.82805	0.863
		Married	-5.98074	0.167

*. The mean difference is significant at the .05 level.

Post Hoc Tests

Multiple Comparisons

Table (3) Tukey HSD test for educational level variable

Dependent Variable	(I) Education Level	(J) Education Level	Mean Difference (I-J)	Sig.
Physical Function	None	Primary	-8.55663	0.182
		Secondary	-12.23917(*)	0.015
		university education	-22.34830(*)	0.000
	Primary	None	8.55663	0.182
		Secondary	-3.68254	0.860
		university education	-13.79167	0.071
	Secondary	None	12.23917(*)	0.015
		Primary	3.68254	0.860
		university education	-10.10913	0.258
	university education	None	22.34830(*)	0.000
		Primary	13.79167	0.071
		Secondary	10.10913	0.258
Role Function	None	Primary	-5.09856	0.770
		Secondary	-8.95618	0.291
		university education	-4.74818	0.880
	Primary	None	5.09856	0.770
		Secondary	-3.85762	0.912
		Higher education	0.35038	1.000
	Secondary	None	8.95618	0.291
		Primary	3.85762	0.912
		Higher education	4.20800	0.928
	university education	None	4.74818	0.880
		Primary	-0.35038	1.000
		Secondary	-4.20800	0.928
Social Functioning	None	Primary	2.79788	0.902
		Secondary	8.25243	0.152
		university r education	9.81493	0.196
	Primary	None	-2.79788	0.902
		Secondary	5.45455	0.621
		university education	7.01705	0.569
	Secondary	None	-8.25243	0.152
		Primary	-5.45455	0.621
		university r education	1.56250	0.991
	university education	None	-9.81493	0.196
		Primary	-7.01705	0.569
		Secondary	-1.56250	0.991
Emotional Functioning	None	Primary	8.34363	0.245
		Secondary	11.27292(*)	0.044
		university education	8.23473	0.426
	Primary	None	-8.34363	0.245
		Secondary	2.92929	0.934
		university education	-0.10890	1.000
	Secondary	None	-11.27292(*)	0.044
		Primary	-2.92929	0.934
		university r education	-3.03819	0.953
	university education	None	-8.23473	0.426
		Primary	0.10890	1.000
		Secondary	3.03819	0.953

Dependent Variable	(I) Education Level	(J) Education Level	Mean Difference (I-J)	Sig.
Cognitive Functioning	None	Primary	-10.17652	0.067
		Secondary	-5.68398	0.476
		university education	-23.75607(*)	0.000
	Primary	None	10.17652	0.067
		Secondary	4.49254	0.757
		university education	-13.57955	0.066
	Secondary	None	5.68398	0.476
		Primary	-4.49254	0.757
		university education	-18.07209(*)	0.005
	university education	None	23.75607(*)	0.000
		Primary	13.57955	0.066
		Secondary	18.07209(*)	0.005
Pain	None	Primary	-0.93557	0.996
		Secondary	0.64211	0.999
		university education	7.84284	0.444
	Primary	None	0.93557	0.996
		Secondary	1.57768	0.988
		university education	8.77841	0.427
	Secondary	None	-0.64211	0.999
		Primary	-1.57768	0.988
		university education	7.20073	0.578
	university education	None	-7.84284	0.444
		Primary	-8.77841	0.427
		Secondary	-7.20073	0.578
Fatigue	None	Primary	5.34079	0.613
		Secondary	0.85786	0.997
		university education	11.00998	0.163
	Primary	None	-5.34079	0.613
		Secondary	-4.48292	0.790
		university education	5.66919	0.764
	Secondary	None	-0.85786	0.997
		Primary	4.48292	0.790
		university education	10.15212	0.282
	university education	None	-11.00998	0.163
		Primary	-5.66919	0.764
		Secondary	-10.15212	0.282
Financial Impact	None	Primary	7.10797	0.518
		Secondary	5.87661	0.637
		university education	20.32767(*)	0.007
	Primary	None	-7.10797	0.518
		Secondary	-1.23136	0.996
		university education	13.21970	0.223
	Secondary	None	-5.87661	0.637
		Primary	1.23136	0.996
		university education	14.45106	0.141
	university education	None	-20.32767(*)	0.007
		Primary	-13.21970	0.223

		Secondary	-14.45106	0.141
Global Quality of Life	None	Primary	-3.53928	0.671
		Secondary	-1.51667	0.958
		university education	-9.22583	0.074
	Primary	None	3.53928	0.671
		Secondary	2.02261	0.937
		university education	-5.68655	0.523
	Secondary	None	1.51667	0.958
		Primary	-2.02261	0.937
		university education	-7.70916	0.233
	university education	None	9.22583	0.074
		Primary	5.68655	0.523
		Secondary	7.70916	0.233

*. The mean difference is significant at the .05 level.

Post Hoc Tests

Multiple Comparisons

Table (4) Tukey test for place of residence variable

Dependent Variable	(I) Place of Residence	(J) Place of Residence	Mean Difference (I-J)	Sig.
Physical Function	City	Village	1.56140	0.894
		Camp	11.89474	0.363
	Village	City	-1.56140	0.894
		Camp	10.33333	0.453
	Camp	City	-11.89474	0.363
		Village	-10.33333	0.453
Role Function	City	Village	-1.00522	0.969
		Camp	3.85965	0.929
	Village	City	1.00522	0.969
		Camp	4.86486	0.886
	Camp	City	-3.85965	0.929
		Village	-4.86486	0.886
Social Functioning	City	Village	0.09365	1.000
		Camp	-9.29825	0.493
	Village	City	-0.09365	1.000
		Camp	-9.39189	0.474
	Camp	City	9.29825	0.493
		Village	9.39189	0.474
Emotional Functioning	City	Village	-0.94180	0.962
		Camp	-8.90351	0.585
	Village	City	0.94180	0.962
		Camp	-7.96171	0.641
	Camp	City	8.90351	0.585
		Village	7.96171	0.641
Cognitive Functioning	City	Village	4.23779	0.420
		Camp	14.03509	0.228
	Village	City	-4.23779	0.420
		Camp	9.79730	0.472
	Camp	City	-14.03509	0.228
		Village	-9.79730	0.472
Pain	City	Village	-2.84021	0.683
		Camp	-11.57895	0.373
	Village	City	2.84021	0.683
		Camp	-8.73874	0.558
	Camp	City	11.57895	0.373
		Village	8.73874	0.558
Fatigue	City	Village	-3.49376	0.571
		Camp	-10.17544	0.476
	Village	City	3.49376	0.571
		Camp	-6.68168	0.717
	Camp	City	10.17544	0.476
		Village	6.68168	0.717
Financial Impact	City	Village	-19.70128(*)	0.000
		Camp	-34.38596(*)	0.002
	Village	City	19.70128(*)	0.000
		Camp	-14.68468	0.290
	Camp	City	34.38596(*)	0.002

		Village	14.68468	0.290
Global Quality of Life	City	Village	3.39912	0.357
		Camp	6.31579	0.573
	Village	City	-3.39912	0.357
		Camp	2.91667	0.884
	Camp	City	-6.31579	0.573
		Village	-2.91667	0.884

*. The mean difference is significant at the .05 level.

Post Hoc Tests

Multiple Comparisons

Table (5) Tukey HSD test for treatment variable

Dependent Variable	(I) Treatment	(J) Treatment	Mean Difference (I-J)	Sig.
Physical Function	Chemotherapy	Chemotherapy and surgery	0.45646	0.993
		other treatment modalities	14.07143	0.264
	Chemotherapy and surgery	Chemotherapy	-0.45646	0.993
		other treatment modalities	13.61497	0.248
	other treatment modalities	Chemotherapy	-14.07143	0.264
		Chemotherapy and surgery	-13.61497	0.248
Role Function	Chemotherapy	Chemotherapy and surgery	-0.15120	0.999
		other treatment modalities	25.17857	0.053
	Chemotherapy and surgery	Chemotherapy	0.15120	0.999
		other treatment modalities	25.32977(*)	0.036
	other treatment modalities	Chemotherapy	-25.17857	0.053
		Chemotherapy and surgery	-25.32977(*)	0.036
Social Functioning	Chemotherapy	Chemotherapy and surgery	0.15756	0.999
		other treatment modalities	15.05952	0.175
	Chemotherapy and surgery	Chemotherapy	-0.15756	0.999
		other treatment modalities	14.90196	0.149
	other treatment modalities	Chemotherapy	-15.05952	0.175
		Chemotherapy and surgery	-14.90196	0.149
Emotional Functioning	Chemotherapy	Chemotherapy and surgery	3.85791	0.618
		other treatment modalities	6.78571	0.746
	Chemotherapy and surgery	Chemotherapy	-3.85791	0.618
		other treatment modalities	2.92781	0.941
	other treatment modalities	Chemotherapy	-6.78571	0.746
		Chemotherapy and surgery	-2.92781	0.941
Cognitive Functioning	Chemotherapy	Chemotherapy and surgery	4.45314	0.490
		other treatment modalities	14.88095	0.211
	Chemotherapy and surgery	Chemotherapy	-4.45314	0.490
		other treatment modalities	10.42781	0.423
	other treatment modalities	Chemotherapy	-14.88095	0.211
		Chemotherapy and surgery	-10.42781	0.423
Pain	Chemotherapy	Chemotherapy and surgery	4.33060	0.504
		other treatment modalities	-23.86905(*)	0.018
	Chemotherapy and surgery	Chemotherapy	-4.33060	0.504
		other treatment modalities	-28.19964(*)	0.002
	other treatment modalities	Chemotherapy	23.86905(*)	0.018
		Chemotherapy and surgery	28.19964(*)	0.002
Fatigue	Chemotherapy	Chemotherapy and surgery	4.46694	0.497
		other treatment modalities	-18.49206	0.097
	Chemotherapy and surgery	Chemotherapy	-4.46694	0.497
		other treatment modalities	-22.95900(*)	0.019
	other treatment modalities	Chemotherapy	18.49206	0.097
		Chemotherapy and surgery	22.95900(*)	0.019

Dependent Variable	(I) Treatment	(J) Treatment	Mean Difference (I-J)	Sig.
Financial Impact	Chemotherapy	Chemotherapy and surgery	-4.71416	0.588
		other treatment modalities	8.69048	0.700
	Chemotherapy and surgery	Chemotherapy	4.71416	0.588
		other treatment modalities	13.40463	0.389
	other treatment modalities	Chemotherapy	-8.69048	0.700
		Chemotherapy and surgery	-13.40463	0.389
Global Quality of Life	Chemotherapy	Chemotherapy and surgery	1.78412	0.808
		other treatment modalities	12.55952	0.128
	Chemotherapy and surgery	Chemotherapy	-1.78412	0.808
		other treatment modalities	10.77540	0.183
	other treatment modalities	Chemotherapy	-12.55952	0.128
		Chemotherapy and surgery	-10.77540	0.183

*. The mean difference is significant at the .05 level.

Post Hoc Tests

Multiple Comparisons

Table (6) Tukey HSD test for onset of cancer diagnosis

Dependent Variable	onset of diagnosis	Onset of diagnosis	Mean Difference (I-J)	Sig.
Physical Function	< 6 months	6- <12 months	0.39576	1.000
		12 - <24 months	3.06199	0.899
		>= 24 months	10.99353	0.473
	6- <12 months	< 6 months	-0.39576	1.000
		12 - <24 months	2.66622	0.924
		>= 24 months	10.59777	0.497
	12 - <24 months	< 6 months	-3.06199	0.899
		6- <12 months	-2.66622	0.924
		>= 24 months	7.93155	0.737
	>= 24 months	< 6 months	-10.99353	0.473
		6- <12 months	-10.59777	0.497
		12 - <24 months	-7.93155	0.737
Role Function	< 6 months	6- <12 months	2.12766	0.971
		12 - <24 months	5.20833	0.762
		>= 24 months	4.76190	0.955
	6- <12 months	< 6 months	-2.12766	0.971
		12 - <24 months	3.08067	0.933
		>= 24 months	2.63425	0.992
	12 - <24 months	< 6 months	-5.20833	0.762
		6- <12 months	-3.08067	0.933
		>= 24 months	-0.44643	1.000
	>= 24 months	< 6 months	-4.76190	0.955
		6- <12 months	-2.63425	0.992
		12 - <24 months	0.44643	1.000
Social Functioning	< 6 months	6- <12 months	-0.64355	0.998
		12 - <24 months	-1.66860	0.977
		>= 24 months	11.46384	0.374
	6- <12 months	< 6 months	0.64355	0.998
		12 - <24 months	-1.02504	0.994
		>= 24 months	12.10740	0.316
	12 - <24 months	< 6 months	1.66860	0.977
		6- <12 months	1.02504	0.994
		>= 24 months	13.13244	0.270
	>= 24 months	< 6 months	-11.46384	0.374
		6- <12 months	-12.10740	0.316
		12 - <24 months	-13.13244	0.270
Emotional Functioning	< 6 months	6- <12 months	7.30453	0.282
		12 - <24 months	4.30974	0.774
		>= 24 months	12.06643	0.411
	6- <12 months	< 6 months	-7.30453	0.282
		12 - <24 months	-2.99479	0.903
		>= 24 months	4.76190	0.927
	12 - <24 months	< 6 months	-4.30974	0.774
		6- <12 months	2.99479	0.903
		>= 24 months	7.75670	0.764
	>= 24 months	< 6 months	-12.06643	0.411
		6- <12 months	-4.76190	0.927
		12 - <24 months	-7.75670	0.764

Dependent Variable	Onset of Diagnosis	onset of Diagnosis	Mean Difference (I-J)	Sig.
Cognitive Functioning	< 6 months	6- <12 months	-4.81788	0.594
		12 - <24 months	6.36896	0.439
		>= 24 months	8.93592	0.617
	6- <12 months	< 6 months	4.81788	0.594
		12 - <24 months	11.18684(*)	0.035
		>= 24 months	13.75380	0.234
	12 - <24 months	< 6 months	-6.36896	0.439
		6- <12 months	-11.18684(*)	0.035
		>= 24 months	2.56696	0.986
	>= 24 months	< 6 months	-8.93592	0.617
		6- <12 months	-13.75380	0.234
		12 - <24 months	-2.56696	0.986
Pain	< 6 months	6- <12 months	1.69206	0.973
		12 - <24 months	-3.35005	0.866
		>= 24 months	-11.75779	0.398
	6- <12 months	< 6 months	-1.69206	0.973
		12 - <24 months	-5.04211	0.626
		>= 24 months	-13.44985	0.270
	12 - <24 months	< 6 months	3.35005	0.866
		6- <12 months	5.04211	0.626
		>= 24 months	-8.40774	0.690
	>= 24 months	< 6 months	11.75779	0.398
		6- <12 months	13.44985	0.270
		12 - <24 months	8.40774	0.690
Fatigue	< 6 months	6- <12 months	4.76316	0.626
		12 - <24 months	0.18647	1.000
		>= 24 months	-12.13992	0.378
	6- <12 months	< 6 months	-4.76316	0.626
		12 - <24 months	-4.57668	0.702
		>= 24 months	-16.90307	0.111
	12 - <24 months	< 6 months	-0.18647	1.000
		6- <12 months	4.57668	0.702
		>= 24 months	-12.32639	0.382
	>= 24 months	< 6 months	12.13992	0.378
		6- <12 months	16.90307	0.111
		12 - <24 months	12.32639	0.382

Dependent Variable	onset of Diagnosis	Onset of Diagnosis	Mean Difference (I-J)	Sig.
Financial Impact	< 6 months	6- <12 months	-4.54426	0.777
		12 - <24 months	-9.22068	0.299
		>= 24 months	-2.82187	0.990
	6- <12 months	< 6 months	4.54426	0.777
		12 - <24 months	-4.67642	0.796
		>= 24 months	1.72239	0.998
	12 - <24 months	< 6 months	9.22068	0.299
		6- <12 months	4.67642	0.796
		>= 24 months	6.39881	0.901
	>= 24 months	< 6 months	2.82187	0.990
		6- <12 months	-1.72239	0.998
		12 - <24 months	-6.39881	0.901
Global Quality of Life	< 6 months	6- <12 months	3.59316	0.589
		12 - <24 months	5.25817	0.340
		>= 24 months	9.40623	0.311
	6- <12 months	< 6 months	-3.59316	0.589
		12 - <24 months	1.66500	0.947
		>= 24 months	5.81307	0.702
	12 - <24 months	< 6 months	-5.25817	0.340
		6- <12 months	-1.66500	0.947
		>= 24 months	4.14807	0.878
	>= 24 months	< 6 months	-9.40623	0.311
		6- <12 months	-5.81307	0.702
		12 - <24 months	-4.14807	0.878

*. The mean difference is significant at the .05 level.